



Safety & Buildings Division
201 West Washington Avenue
P.O. Box 2658
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Evaluation #

200509-W
(Replaces 200405-W Revised)

Wisconsin Building Product Evaluation

Material

LPI 18, LPI 20W, LPI 20, LPI 20X1.5 (Also known as LPI 20Plus), LPI 20X1.7,
LPI 32W, LPI 32 and LPI 42X1.8 (Also known as LPI 42Plus)
Series Wood I-joists

Manufacturers

Louisiana-Pacific Corporation
11500 Reading and Tyler Rd.
Red Bluff, CA 96080

Louisiana-Pacific Corporation
2706 HWY 421 North
Wilmington, NC 28401

Louisiana-Pacific Corporation
900 Chenin du lac Hippolyte
Larouche, PQ
Canada G0W 1Z0

Louisiana-Pacific Corporation
101, 4th Avenue
St. Prime, PQ
Canada G8J1H3

Licensee

Les Chantiers de Chibougamau, Ltd.
521 Merrill Rd.
Chibougamau, QC
Canada G8P 2K7

Jager Building Systems, Inc.
44 Simpson Road
Bolton, ON
Canada L7E 1Y4

SCOPE OF EVALUATION

GENERAL: This report evaluates the use of LPI 18, LPI 20W, LPI 20, LPI 20X1.5 (also known as LPI 20PLUS), LPI 20X1.7, LPI 32W, LPI 32 and LPI 42X1.8 (also known as LPI 42PLUS) Series Wood I-Joists, manufactured by Louisiana-Pacific Corporation (LP), for use as structural framing lumber (engineered and the fire-resistive design requirements).

The **Comm** requirements below in accordance with the current **Wisconsin Uniform Dwelling Code for 1 & 2 family dwellings**:

- **Structural:** The I-Joists were evaluated for use in dry locations, not limited to floor and roof joists in accordance with **ss. Comm 21.02 (3)(a)** and **Comm 21.19**.

The **IBC** requirements below in accordance with the **Wisconsin Amended ICC Code**:

- **Structural:** The I-Joists were evaluated for use in dry locations, not limited to floor and roof joists in accordance with **ss. IBC 2301.2, 2301.2.1, 2303.1, 2303.1.2, and 2306.1**.
- **Fire-Resistive Assembly:** The I-Joists were evaluated for use as a component of a one-hour fire-resistive rated assembly in accordance with **ss. IBC 702.1, 703.1, 703.2, 703.3, 710.1 and Table 719.1(3), Item 21-1.1**.

DESCRIPTION AND USE

The evaluated I-Joists are used in residential and light commercial construction as, but are not limited to, floor joists, rafters, blocking panels and rim joists. The I-Joists have structural wood flanges and a single web as specified in the approved Quality Control Manual (herein referred to as the Manual) that contains the manufacturing standards. Web sections are end-jointed forming a continuous web. Web end joints shall be of the types specified in the Manual. The web-flange connection is made by inserting the beveled edge of the web into a groove centered in the wide face of the flange member.

The manufacturing tolerances of the I-joists shall be as specified in the Manual.

Materials:

1. **Flanges:** The flange material is solid-sawn lumber meeting the requirements in the Manual.
2. **Webs:** Web panels must be at least 3/8-inch (95 mm) thick and comply with U.S. Voluntary Product Standard PS 2 and the Manual.
3. **Adhesive:** Adhesives are exterior wet use types complying with ASTM D2559 and shall be of the types specified in the Manual.

Design: LPI 18, LPI 20W, LPI 20, LPI 20X1.5, LPI 20X1.7, LPI 32W, LPI 32 and LPI 42X1.8 Series I-Joists must be designed in accordance with Tables 1 to 9 of this evaluation. The following conditions also apply:

1. I-joists shall be designed for appropriate loads and deflection limitations based upon the **Wisconsin Uniform Dwelling Code for 1 & 2 family dwellings** and the **Wisconsin Amended ICC Code**. The cumulative effects of short-term loads, such as snow, shall be considered in determining the duration of load. For snow load, no greater duration of load factor than 1.15 shall be used.
2. Web stiffeners are optional when the I-joists are designed in accordance with Tables 1 to 8, except when any of the following conditions are encountered:
 - a. Bird's mouth cuts. See Figure 6, Detail 6.
 - b. Where sloped joist hangers support I-joists.
 - c. Where joist hangers do not laterally support the I-joist's top flange.
 - d. When required by Table 1 due to actual reaction loads.
3. The tabulated maximum resistive moments given in Table 1 for I-joists shall **not** be increased by any code allowed repetitive member use factor.
4. An analytical approach for the location and size of I-joist web holes, including use of the LP design software, can be used in lieu of the hole chart tables or web hole equations noted in this evaluation, provided the hole calculations are reviewed and approved by a professional engineer. Size and location of allowable web holes are noted in Tables 2A, 2B, 3A and 3B for the LPI 18 Series I-Joists and Tables 4A, 4B, 5A and 5B for all other LPI Series I-Joists described in this report. Web hole equations are noted in Tables 6 and 7 for LPI 18 and other LPI Series I-Joists, respectively. If the engineer uses the LP design software for web hole design, the engineer must provide proper reference to the software. See **LIMITATIONS OF APPROVAL** section for additional details. Figure 1 shows the web hole drawings.
5. For the purpose of nailed connections, such as a wood structural panel connection to an I-joist top flange, the assumed specific gravity for the flange material shall be 0.42. Nailing schedules are given in Table 8 of this report.

Installation: LPI 18, LPI 20W, LPI 20, LPI 20X1.5, LPI 20X1.7, LPI 32W, LPI 32 and LPI 42X1.8 Series I-Joists are installed using details shown in Figures 1 to 8 of this evaluation report.

- All I-joist top flanges must be laterally supported, and the ends must be restrained to prevent rollover. This support is normally provided by diaphragm sheathing attached to the top flange and an end wall or shear-transfer panel capable of transferring 50 pounds per foot (730 N/m). Blocking or cross bracing with equivalent strength may also be used.

- Sheathing attachment to the I-joist flanges shall not exceed the nail sizing and minimum spacing requirements given in Table 8 of this evaluation report.
- I-joist attachment to supports shall not exceed the nail sizing and minimum spacing requirements given in Table 8 of this evaluation report.
- Bridging may be omitted in floor and roof joist applications. Bracing is required during construction in accordance with the manufacturer's installation instructions.
- The material, size, and attachment of web reinforcement shall be as illustrated and described in Figure 7 of this evaluation report.
- Details are directed towards proper installation of all LPI wood I-joists. Other considerations, such as diaphragm connections, nailing and load transfers, require supplementary consideration by a registered engineer or architect.

LPI Joists Rim Board Applications: The LPI I-joists are recognized for use as rim boards as shown in Figure 4, Detail 2.

For the purpose of this evaluation report, rim boards are defined as continuously supported structural members, either located at the joist elevation in an end bearing wall or located parallel to the joist framing, that are the full depth of the joist space and are used for any of the following purposes:

- Transfer, from above to below, of all vertical loads at the rim board location. Allowable vertical loads are noted in Figure 4.
- Diaphragm attachment (sheathing to the top edge of rim board).
- Transfer of maximum 230 plf (3358 N/m) in-plane lateral loads from the diaphragm to the wall plate below. See Figure 4 for shear transfer details.
- Lateral support to the joist or rafter (resistance against rotation) through attachment to the joist or rafter.

Identification: LPI 18, LPI 20W, LPI 20, LPI 20X1.5, LPI 20X1.7, LPI 32W, LPI 32 and LPI 42X1.8 Series I-Joists shall be identified with markings noting the manufacturer's name and/or trademark, plant number, product designation, evaluation report number (200405-W) and third-party inspection agency name and/or trademark as required by **ss. Comm 20.18 or 61.60** of the current UDC and Wisconsin Commercial Code, respectively.

TESTS AND RESULTS

Evidence Submitted, Third Party Quality Control Agency Approval Letter:

- APA-The Engineered Wood Association approval letter on Louisiana-Pacific Corporation Test Reports verify that a representative from APA-The Engineered Wood Association has witness the following qualification tests:
 1. Flange Finger Joint Tension Capacity.
 2. Moment and Stiffness Capacities.
 3. End Reaction Capacity.
 4. Intermediate Reaction Capacity.
 5. Cantilever Capacity.
 6. Blocking Panel/Rim Joist Capacity.
 7. Creep Behavior Recovery.
 8. Round and Rectangular Web Opening Shear Capacity.
- LPI 18, LPI 20W, LPI 20, LPI 20X1.5, LPI 20X1.7, LPI 32W, LPI 32 and LPI 42X1.8 Series I-Joist test reports are on file with the department and were prepared in accordance with ASTM D5055.
- The following Quality Control Manuals are on file with the department:
 1. Louisiana-Pacific Corporation Quality Control Manual for LPI Series I-Joists.
- Fire Endurance Assembly Report: A report of 1-hour fire endurance assembly for LPI 20W, LPI 20, LPI 20X1.5, LPI 20X1.7, LPI 32W, LPI 32 and LPI 42X1.8 Series I-Joists, using the component additive method (CAM) principles in accordance with ASTM E119, was prepared by an independent third party.

One-Hour Fire-Resistance-Rated Floor-Ceiling Assembly

- The single-layer floor or roof deck consists of 23/32-inch (18.3 mm) thick tongue-and-groove APA-rated plywood sheathing, Sturd-I-Floor or equivalent (Exposure 1 or Exterior glue), over LPI I-joists spaced up to 24 inches (610 mm) on center. In lieu of the 23/32-inch (18.3 mm) thick floor sheathing, 19/32-inch (15.1 mm) thick sheathing with a 3/4-inch (19.1 mm) thick fill of Gyp-Crete is acceptable.

- The cavity may be insulated with optional 3-1/2-inch (89 mm) thick R-11 glass fiber insulation batts. If the glass fiber insulation batts are used, the insulation must be installed between I-joists with stay wires placed a minimum of 12 inches (305 mm) on center. Stay wires ends shall be 3/4 inch (19.1 mm) above the lower surface of the bottom flanges. Insulation shall be pulled down to completely cover the I-joist web. RCI resilient channels, attached to the bottom flange of the I-joists with the gypsum wallboard attached to the channel, are options, provided the channels are spaced up to 16 inches (406 mm) on center.
- The ceiling consists of two layers of 1/2 -inch (12.7 mm) thick Type X gypsum board attached to the I-joist's bottom flange. Long edges of sheathing must be perpendicular to the I-joists with staggered end joints. The first layer of gypsum wallboard is attached perpendicular to the I-joists, with end joints staggered, using 1-5/8-inch (41.3 mm) long Type W screws spaced 12 inches (305 mm) on center. The second layer of gypsum wallboard is attached perpendicular to the I-joists. All joints are staggered from the first layer using 2-1/4-inch (57 mm) long Type W screws spaced 12 inches (305 mm) on center on the I-joists, and 1-1/2-inch (38 mm) long Type G screws spaced 16 inches (406 mm) on center between the I-joists. The second layer must be finished with joint tape and compound. See Figure 8 for additional details.

Sound Ratings: The one-hour fire-resistance-rated floor-ceiling assembly system has the sound transmission and impact insulation classification noted in Table 9 of this report.

LIMITATIONS OF APPROVAL

That the LPI 18, LPI 20W, LPI 20, LPI 20X1.5, LPI 20X1.7, LPI 32W, LPI 32 and LPI 42X1.8 Series I-Joists described in this evaluation report comply with the codes listed under the **SCOPE OF EVALUATION** section of this report, subject to the following conditions:

- The I-joists are designed in accordance with this report. Details provided in Figures 1 through 8 and Tables 1 through 7 of this report must be confirmed for applicability for each project, as required by the building official. Engineering calculations may be required. The following items should be considered when submitting calculations to the building official: lateral support, vertical support, connections (including selection of joist hangers), lateral force resistance, location and size of web holes and applied loads and spans.
- Deflections are limited as set forth in the applicable code, using the design properties given in Table 1.
- Where a one-hour fire-resistance rating is required, construction shall comply with the description in the **TESTS AND RESULTS** section, Figure 8 of this report, and **ss. IBC 702.1, 703.1, 703.2, 703.3, 710.1 and Table 719.1(3), Item 21-1.1**.
- The I-joists must be installed in accordance with this evaluation report and the manufacturer's installation details. Installation details may require supplementary considerations. Descriptive literature indicating joist composition, dimensions, installation details including locations and details of blocking, bridging, I-joist cuts and this evaluation report must be furnished upon request to code authorities having jurisdiction.

Floor and roof load tables may be used without submittal of calculations provided that the following information is shown on the plans submitted for each project:

- Building product evaluation number 200509-W, product designation, spans, spacing, loading conditions, bearing details, and other information when required by **ss. Comm 20.18 or 61.60** of the current **UDC and Wisconsin Commercial Code**, respectively.
- Span and load tables are based on simple and multiple span uniformly distributed load conditions for both floors and roofs. Any variation will require submittal of calculations without the use of the load tables for that portion of the project when required by **ss. Comm 20.18 or 61.60**. Further, applications not covered by this building product evaluation report and requiring special consideration may be handled by contacting Louisiana-Pacific Corporation's Engineered Wood Products Technical Support Services staff for guidance.
- The I-joists are manufactured under an approved quality control program with inspections by APA-The Engineered Wood Association at Louisiana-Pacific Corporation Engineered Wood Products facilities in Wilmington, North Carolina, Red Bluff, California, Larouche, Quebec, Canada, St. Prime, Quebec, Canada and at the Jager Building Systems facility in Bolton, Ontario, Canada and at the Les Chantiers de Chibougamau, Limited, facility in Chibougamau, Quebec, Canada.
- When the design of the I-joists assumes composite action, the floor system shall be installed as described in NER-108 for Sturd-I-Floor or APA-rated sheathing for field glued panels.
- The I-joists are not approved for use where hourly rated construction is required by the Wisconsin Building Codes, unless part of a listed assembly.

This approval will be valid through December 31, 2010, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The product approval is applicable to projects approved under the current edition of the applicable codes. This approval may be void for project approvals made under future applicable editions. The Wisconsin Building Product Evaluation number must be provided when plans that include this product are submitted for review.

The department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement not specified in this document.

Lee Finley, Jr.
Product & Material Review
Integrated Services Bureau

200509-W.doc

JOIST SERIES	JOIST DEPTH (in)	FLANGE WIDTH (in)	MOMENT (see note 4) (lbs-ft)	El x 10 ⁶ (lbs-in ²)	K x 10 ⁶ (ft-lbs./in)	SHEAR (lbs.)	END REACTION 1.5" MINIMUM BEARING LENGTH (lbs.)	INTERIOR REACTION 3.5" MINIMUM BEARING LENGTH (lbs.)
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							W/O W.S.	W/ W.S.	W/O W.S.	W/ W.S.
LPI 18	9-1/2	2-1/2	2365	142	0.355	1120	865	1120	1820	1840
	11-7/8	2-1/2	3100	248	0.435	1225	930	1225	2135	2295
	14	2-1/2	3820	371	0.508	1475	1080	1475	2205	3170
	16	2-1/2	4274	514	0.577	1635	1090	1635	2205	3365
LPI 20W	9-1/2	2-1/2	2780	176	0.358	1230	950	1230	2000	2025
	11-7/8	2-1/2	3645	300	0.438	1350	1025	1350	2350	2525
	14	2-1/2	4495	441	0.512	1620	1190	1620	2425	3490
	16	2-1/2	5028	602	0.582	1800	1200	1800	2425	3700
LPI 20	9-1/2	2-1/2	2780	176	0.358	1230	950	1230	2000	2025
	11-7/8	2-1/2	3645	300	0.438	1350	1025	1350	2350	2525
	14	2-1/2	4495	441	0.512	1620	1190	1620	2750	3490
	16	2-1/2	5028	602	0.582	1800	1200	1800	2850	3700
LPI 20X1.5	9-1/2	2-1/2	2810	185	0.358	1230	950	1230	2000	2025
	11-7/8	2-1/2	3755	318	0.438	1350	1025	1350	2350	2525
	14	2-1/2	4605	474	0.512	1620	1190	1620	2425	3490
	16	2-1/2	5050	652	0.582	1800	1200	1800	2425	3700
LPI 20X1.7	9-1/2	2-1/2	3320	206	0.358	1230	950	1230	2000	2025
	11-7/8	2-1/2	4300	345	0.438	1350	1025	1350	2350	2525
	14	2-1/2	5175	500	0.512	1620	1190	1620	2750	3490
	16	2-1/2	6000	673	0.582	1800	1200	1800	2850	3700
LPI 32W	9-1/2	2-1/2	3620	243	0.213	1250	950	1250	2000	2025
	11-7/8	2-1/2	4690	406	0.267	1350	1025	1350	2350	2525
	14	2-1/2	5645	589	0.313	1620	1190	1620	2500	3490
	16	2-1/2	6545	791	0.358	1800	1200	1800	2500	3700
LPI 32	9-1/2	2-1/2	3620	243	0.213	1250	950	1250	2000	2025
	11-7/8	2-1/2	4690	406	0.267	1350	1025	1350	2350	2525
	14	2-1/2	5645	589	0.313	1620	1190	1620	2750	3490
	16	2-1/2	6545	791	0.358	1800	1200	1800	2850	3700
LPI 42X1.8	9-1/2	3-1/2	5375	328	0.501	1305	1280	1305	3020	3500
	11-7/8	3-1/2	6965	555	0.613	1615	1280	1550	3020	3500
	14	3-1/2	8390	810	0.716	1830	1280	1620	3020	3500
	16	3-1/2	9725	1100	0.813	2020	1280	1800	3020	3500

For SI Units: 1 in = 25.4 mm, 1 ft = 304.8 mm, 1 ft-lb. = 1.356 N-m, 1 LB = 4.448 N, 1 in²-lb = 0.00287 N-m²

NOTES:

1. The moment and shear values are for normal duration of load. Duration of load adjustments may be applied in accordance with Section 2316 of the UBC (when using the UBC) or Part 2.3.2 of the NDS- 1997 edition (when using the IBC).
2. The allowable design values are for dry use conditions only. Dry use applies to products installed in dry, covered and well ventilated conditions, where the equilibrium moisture content will not exceed 16%.
3. When calculating deflection, both bending and shear deformation shall be determined:
For bending deflection use the standard engineering formulas.
Example: Formula for uniform load on a simple span I-joist:

$$\Delta = \frac{22.5WL^4}{EI} + \frac{WL^2}{K}$$

where:

- Δ = Deflection in inches.
- W = Uniform load in pounds per lineal foot (plf).
- L = Design span in feet.
- K = Shear deformation coefficient.
- EI = Stiffness in lbs-in.².

4. Moment capacity shall **not** be increased by any code allowed repetitive member use factor.
5. W/ W.S. is with web stiffeners, W/O W.S. is without web stiffeners.

TABLE 2A – LPI 18 SERIES I-JOISTS HOLE CHART: 40 PSF LIVE LOAD, 15 PSF DEAD LOAD, UP TO 24" OC

Joist Depth	Clear Span	Circular Holes											
		Distance from End Support						Distance from Interior Support					
		Hole Diameter						Hole Diameter					
		2"	4"	6"	8"	10"	12"	2"	4"	6"	8"	10"	12"

9-1/2"	6'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	1'-6"	-	-	-
	8'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	1'-6"	-	-	-
	10'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	1'-6"	-	-	-
	12'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	1'-9"	-	-	-
	14'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	3'-1"	-	-	-
	16'	1'-0"	1'-0"	2'-1"	-	-	-	1'-0"	2'-4"	4'-4"	-	-	-
	18'	1'-0"	1'-5"	3'-3"	-	-	-	1'-9"	3'-6"	5'-10"	-	-	-
11-7/8"	20'	1'-0"	2'-7"	4'-7"	-	-	-	2'-11"	4'-11"	7'-6"	-	-	-
	6'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	-	-
	10'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	-	-
	12'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	-	-
	14'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-8"	3'-5"	-	-
	16'	1'-0"	1'-0"	1'-6"	2'-6"	-	-	1'-0"	1'-6"	3'-2"	4'-9"	-	-
	18'	1'-0"	1'-0"	2'-4"	3'-8"	-	-	1'-3"	3'-1"	4'-5"	6'-3"	-	-
	20'	1'-0"	1'-7"	3'-1"	5'-1"	-	-	2'-11"	4'-5"	6'-0"	8'-0"	-	-
14"	22'	1'-2"	2'-10"	4'-6"	6'-2"	-	-	4'-4"	6'-0"	7'-8"	9'-4"	-	-
	24'	2'-5"	3'-8"	5'-6"	7'-3"	-	-	5'-4"	7'-2"	9'-0"	11'-5"	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-
	12'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-
	14'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	1'-0"	1'-0"	1'-6"	2'-5"	3'-10"	-
	16'	1'-0"	1'-0"	1'-6"	2'-0"	2'-10"	-	1'-0"	1'-1"	2'-4"	3'-11"	5'-2"	-
	18'	1'-0"	1'-0"	1'-6"	2'-9"	4'-1"	-	1'-3"	2'-8"	4'-0"	5'-4"	6'-9"	-
	20'	1'-0"	1'-1"	2'-7"	4'-1"	5'-7"	-	2'-5"	3'-11"	5'-5"	7'-0"	8'-6"	-
	22'	1'-2"	2'-3"	3'-11"	5'-0"	6'-8"	-	3'-9"	5'-5"	6'-7"	8'-3"	9'-11"	-
	24'	1'-10"	3'-8"	4'-10"	6'-8"	7'-11"	-	5'-4"	6'-7"	8'-4"	9'-7"	11'-5"	-
16"	26'	3'-4"	4'-7"	5'-11"	7'-11"	9'-2"	-	6'-5"	8'-5"	9'-9"	11'-8"	13'-0"	-
	28'	4'-3"	5'-8"	7'-1"	9'-2"	10'-7"	-	8'-4"	9'-9"	11'-2"	13'-4"	-	-
	30'	5'-4"	6'-10"	8'-4"	10'-7"	12'-1"	-	9'-9"	11'-3"	12'-9"	15'-0"	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"
	12'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"
	14'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-9"	4'-2"
	16'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-3"	1'-0"	1'-0"	1'-11"	3'-2"	4'-4"	5'-7"
	18'	1'-0"	1'-0"	1'-6"	2'-0"	3'-3"	4'-7"	1'-0"	2'-2"	3'-1"	4'-5"	5'-10"	7'-2"
	20'	1'-0"	1'-1"	2'-1"	3'-1"	4'-7"	6'-1"	2'-5"	3'-5"	4'-11"	6'-0"	7'-6"	9'-0"
	22'	1'-0"	1'-8"	3'-4"	4'-6"	5'-7"	7'-3"	3'-9"	4'-11"	6'-0"	7'-8"	8'-9"	10'-5"
	24'	1'-10"	3'-1"	4'-3"	5'-6"	7'-3"	8'-6"	5'-4"	6'-7"	7'-9"	9'-0"	10'-9"	12'-0"
	26'	3'-4"	4'-0"	5'-3"	6'-7"	8'-6"	9'-10"	6'-5"	7'-9"	9'-1"	10'-5"	12'-4"	-
	28'	4'-3"	5'-8"	6'-4"	7'-9"	9'-11"	11'-3"	7'-8"	9'-1"	10'-6"	11'-11"	14'-0"	-
	30'	5'-4"	6'-10"	7'-7"	9'-1"	10'-7"	12'-10"	9'-9"	10'-6"	12'-0"	13'-6"	-	-

DESIGN ASSUMPTIONS:

- The hole locations listed above are valid for joists supporting only uniform loads. The total uniform load must not exceed 110 plf (e.g., 40 psf Live Load and a 15 psf Dead Load, spaced up to 24" oc). The uniform Dead Load must be at least 10 plf.
- Hole location is measured from the inside face of bearing to the center of a circular hole or obround hole, or to the nearest edge of a rectangular hole, from the closest support.
- Obround holes are not allowed for LPI 18 Series I-Joists.
- Maximum hole depth for circular and rectangular holes is Joist Depth less 4", except the maximum hole depth is 6" for 9-1/2" and 8" for 11-7/8" LPI joists. Maximum hole width for rectangular holes is 18". Where the Maximum Hole Dimension for rectangular holes exceeds the maximum hole depth, the dimension refers to hole width and the hole depth is assumed to be the maximum for that joist depth.
- Holes cannot be located in the span where designated "--", without further analysis by a design professional (see note 8 below).
- Clear Span has NOT been verified for these joists and is shown for informational purposes only! Verify that the joist selected will work for the span and loading conditions needed before checking hole location.

GENERAL NOTES:

- CUT HOLES CAREFULLY! DO NOT OVERCUT HOLES! DO NOT CUT JOIST FLANGES!**
- Circular and rectangular holes may be placed anywhere within the depth of the joist. A minimum 1/4" clear distance is required between the hole and a flange.
- Round holes up to 1-1/2" diameter may be placed anywhere in the web.
- Perforated "knockouts" may be neglected when locating web holes.
- Holes larger than 1-1/2" are not permitted in cantilevers without special engineering.
- Multiple holes must have a clear separation along the length of the joist of at least twice the length of the larger adjacent hole, or a minimum of 12" center-to-center, whichever is greater.
- Multiple holes may be spaced closer provided they fit within the boundary of an acceptable larger hole. Example: two 3" round holes aligned parallel to the joist length may be spaced 2" apart (clear distance) provided that a 3" high by 8" long rectangle or an 8" diameter round hole are acceptable for the joist depth at that location and completely encompass the holes.
- Larger holes, greater uniform loads or non-uniform loads, and closer proximity to supports and other holes may be possible with further analysis (See DESCRIPTION AND USE Item 4 or the web hole shear equations listed in Table 6).
- Not all series are available in all depths. Check availability with a local LP Engineered Wood Products distributor
- SI Units Conversion:** 1 in. = 25.4 mm; 1 ft. = 304.8 mm.

TABLE 2B – LPI 18 SERIES I- JOISTS HOLE CHART: 40 PSF LIVE LOAD, 15 PSF DEAD LOAD, UP TO 24" OC

Joist Depth	Clear Span	Rectangular Holes	
		Distance from End Support	Distance from Interior Support
		Maximum Hole Dimension: Depth or Width	Maximum Hole Dimension: Depth or Width

		2"	4"	6"	8"	10"	12"	14"	16"	2"	4"	6"	8"	10"	12"	14"	16"
9-1/2"	6'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	2'-2"	2'-9"	3'-2"	3'-10"	-	-
	10'	1'-0"	1'-0"	2'-4"	2'-10"	3'-4"	3'-10"	4'-4"	-	1'-0"	1'-11"	3'-9"	4'-3"	4'-9"	-	-	-
	12'	1'-0"	1'-10"	3'-8"	4'-0"	4'-7"	5'-2"	5'-10"	-	1'-9"	3'-7"	5'-5"	6'-0"	-	-	-	-
	14'	1'-5"	2'-10"	5'-0"	5'-4"	6'-1"	6'-9"	-	-	3'-1"	4'-10"	7'-0"	-	-	-	-	-
	16'	2'-6"	4'-1"	6'-1"	6'-11"	7'-4"	-	-	-	4'-9"	6'-5"	-	-	-	-	-	-
	18'	3'-8"	5'-6"	7'-9"	8'-2"	8'-8"	-	-	-	6'-3"	8'-1"	-	-	-	-	-	-
	20'	5'-1"	6'-7"	9'-1"	9'-7"	-	-	-	-	7'-6"	10'-0"	-	-	-	-	-	-
11-7/8"	6'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	1'-6"	3'-0"	3'-5"	4'-0"	-	-
	10'	1'-0"	1'-0"	1'-7"	3'-1"	3'-7"	4'-1"	4'-10"	-	1'-0"	1'-5"	2'-11"	4'-6"	5'-0"	-	-	-
	12'	1'-0"	1'-3"	2'-9"	4'-3"	4'-11"	5'-6"	-	-	1'-9"	2'-11"	4'-6"	-	-	-	-	-
	14'	1'-1"	2'-6"	3'-11"	5'-8"	6'-5"	-	-	-	3'-1"	4'-6"	5'-11"	-	-	-	-	-
	16'	2'-1"	3'-8"	5'-3"	7'-4"	7'-8"	-	-	-	4'-4"	6'-0"	7'-7"	-	-	-	-	-
	18'	3'-3"	5'-0"	6'-5"	8'-8"	-	-	-	-	5'-10"	7'-8"	-	-	-	-	-	-
	20'	4'-7"	6'-1"	8'-1"	-	-	-	-	-	7'-6"	9'-0"	-	-	-	-	-	-
14"	22'	5'-7"	7'-3"	9'-5"	-	-	-	-	-	8'-9"	11'-0"	-	-	-	-	-	-
	24'	7'-3"	8'-6"	10'-11"	-	-	-	-	-	10'-9"	-	-	-	-	-	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-7"	-
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-10"	4'-7"	1'-0"	1'-0"	1'-6"	2'-0"	3'-9"	4'-6"	-	-
	12'	1'-0"	1'-0"	1'-6"	2'-0"	3'-5"	4'-3"	5'-2"	-	1'-0"	1'-0"	1'-6"	2'-11"	5'-1"	6'-0"	-	-
	14'	1'-0"	1'-0"	1'-6"	2'-6"	4'-8"	5'-8"	6'-5"	-	1'-0"	1'-0"	2'-5"	4'-6"	7'-0"	-	-	-
	16'	1'-0"	1'-0"	1'-8"	3'-8"	6'-1"	6'-11"	7'-8"	-	1'-0"	1'-6"	3'-7"	6'-0"	-	-	-	-
	18'	1'-0"	1'-0"	2'-9"	5'-0"	7'-3"	8'-2"	-	-	1'-3"	3'-1"	4'-11"	7'-8"	-	-	-	-
16"	20'	1'-0"	1'-7"	3'-7"	6'-1"	8'-7"	9'-7"	-	-	2'-5"	4'-5"	6'-6"	9'-0"	-	-	-	-
	22'	1'-0"	2'-10"	5'-0"	7'-3"	10'-0"	-	-	-	3'-9"	6'-0"	8'-3"	10'-5"	-	-	-	-
	24'	1'-10"	3'-8"	6'-1"	8'-6"	11'-6"	-	-	-	5'-4"	7'-2"	9'-7"	-	-	-	-	-
	26'	3'-4"	5'-3"	7'-3"	9'-10"	-	-	-	-	6'-5"	9'-1"	11'-0"	-	-	-	-	-
	28'	4'-3"	6'-4"	8'-6"	11'-3"	-	-	-	-	8'-4"	10'-6"	12'-7"	-	-	-	-	-
	30'	5'-4"	7'-7"	9'-10"	12'-10"	-	-	-	-	9'-9"	12'-0"	14'-3"	-	-	-	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-2"	4'-0"	-
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-4"	4'-1"	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-8"	4'-9"	-	-
16"	12'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	4'-7"	5'-6"	-	1'-0"	1'-0"	1'-6"	2'-0"	4'-2"	-	-	-
	14'	1'-0"	1'-0"	1'-6"	2'-0"	3'-7"	6'-1"	-	-	1'-0"	1'-0"	1'-8"	3'-5"	5'-7"	-	-	-
	16'	1'-0"	1'-0"	1'-6"	2'-10"	4'-11"	7'-4"	-	-	1'-0"	1'-1"	3'-2"	5'-2"	7'-2"	-	-	-
	18'	1'-0"	1'-0"	1'-10"	4'-1"	6'-5"	8'-8"	-	-	1'-0"	2'-8"	4'-5"	6'-9"	9'-0"	-	-	-
	20'	1'-0"	1'-7"	3'-1"	5'-1"	7'-7"	-	-	-	2'-5"	3'-11"	6'-0"	8'-0"	-	-	-	-
	22'	1'-0"	2'-3"	4'-6"	6'-8"	8'-11"	-	-	-	3'-9"	5'-5"	7'-8"	9'-11"	-	-	-	-
	24'	1'-10"	3'-8"	5'-6"	7'-11"	10'-4"	-	-	-	4'-9"	7'-2"	9'-0"	11'-5"	-	-	-	-
	26'	2'-8"	4'-7"	6'-7"	9'-2"	11'-10"	-	-	-	6'-5"	8'-5"	10'-5"	13'-0"	-	-	-	-
16"	28'	4'-3"	5'-8"	7'-9"	10'-7"	13'-5"	-	-	-	7'-8"	9'-9"	11'-11"	-	-	-	-	-
	30'	5'-4"	6'-10"	9'-1"	12'-1"	14'-4"	-	-	-	8'-11"	11'-3"	13'-6"	-	-	-	-	-

DESIGN ASSUMPTIONS:

- The hole locations listed above are valid for joists supporting only uniform loads. The total uniform load must not exceed 110 plf (e.g., 40 psf Live Load and a 15 psf Dead Load, spaced up to 24" oc). The uniform Dead Load must be at least 10 plf.
- Hole location is measured from the inside face of bearing to the center of a circular hole, or obround hole, or to the nearest edge of a rectangular hole, from the closest support.
- Obround holes are not allowed in the LPI 18 Series I-Joists.
- Maximum hole depth for circular and rectangular holes is Joist Depth less 4", except the maximum hole depth is 6" for 9-1/2" and 8" for 11-7/8" LPI joists. Maximum hole width for rectangular holes is 18". Where the Maximum Hole Dimension for rectangular holes exceeds the maximum hole depth, the dimension refers to hole width and the hole depth is assumed to be the maximum for that joist depth.
- Holes cannot be located in the span where designated "--", without further analysis by a design professional (see note 8 below).
- Clear Span has NOT been verified for these joists and is shown for informational purposes only! Verify that the joist selected will work for the span and loading conditions needed before checking hole location.

GENERAL NOTES:

- CUT HOLES CAREFULLY! DO NOT OVERCUT HOLES! DO NOT CUT JOIST FLANGES!**
- Circular and rectangular holes may be placed anywhere within the depth of the joist. A minimum 1/4" clear distance is required between the hole and a flange.
- Round holes up to 1-1/2" diameter may be placed anywhere in the web.
- Perforated "knockouts" may be neglected when locating web holes.
- Holes larger than 1-1/2" are not permitted in cantilevers without special engineering.
- Multiple holes must have a clear separation along the length of the joist of at least twice the length of the larger adjacent hole, or a minimum of 12" center-to-center, whichever is greater.
- Multiple holes may be spaced closer provided they fit within the boundary of an acceptable larger hole. Example: two 3" round holes aligned parallel to the joist length may be spaced 2" apart (clear distance) provided that a 3" high by 8" long rectangle or an 8" diameter round hole are acceptable for the joist depth at that location and completely encompass the holes.
- Larger holes, greater uniform loads or non-uniform loads, and closer proximity to supports and other holes may be possible with further analysis (See DESCRIPTION AND USE Item 4 or the web hole shear equations listed in Table 6).
- Not all series are available in all depths. Check availability with a local LP Engineered Wood Products distributor
- SI Units Conversion: 1 in. = 25.4 mm; 1 ft. = 304.8 mm.

TABLE 3A – LPI 18 SERIES I-JOISTS HOLE CHART: 40 PSF LIVE LOAD, 25 PSF DEAD LOAD, UP TO 24" OC

Joist Depth	Clear Span	Circular Holes	
		Distance from End Support	Distance from Interior Support

		Hole Diameter						Hole Diameter					
		2"	4"	6"	8"	10"	12"	2"	4"	6"	8"	10"	12"
9-1/2"	6'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	1'-6"	-	-	-
	8'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	1'-6"	-	-	-
	10'	1'-0"	1'-0"	1'-0"	-	-	-	1'-0"	1'-0"	1'-6"	-	-	-
	12'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	2'-8"	-	-	-
	14'	1'-0"	1'-0"	2'-2"	-	-	-	1'-0"	2'-5"	4'-2"	-	-	-
	16'	1'-0"	1'-8"	3'-3"	-	-	-	1'-11"	3'-7"	5'-7"	-	-	-
	18'	1'-0"	2'-9"	4'-7"	-	-	-	3'-6"	5'-4"	7'-2"	-	-	-
	20'	2'-1"	4'-1"	5'-7"	-	-	-	4'-11"	6'-6"	8'-6"	-	-	-
	6'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	-	-
	10'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	-	-
	12'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-9"	2'-11"	-	-
	14'	1'-0"	1'-0"	1'-6"	2'-6"	-	-	1'-0"	1'-8"	3'-1"	4'-6"	-	-
	16'	1'-0"	1'-0"	2'-1"	3'-8"	-	-	1'-6"	3'-2"	4'-4"	6'-0"	-	-
	18'	1'-0"	1'-10"	3'-3"	5'-0"	-	-	3'-1"	4'-5"	5'-10"	7'-8"	-	-
	20'	1'-7"	3'-1"	4'-7"	6'-1"	-	-	4'-5"	6'-0"	7'-6"	9'-0"	-	-
	22'	2'-10"	4'-6"	5'-7"	7'-9"	-	-	6'-0"	7'-8"	8'-9"	11'-0"	-	-
	24'	4'-3"	5'-6"	7'-3"	9'-1"	-	-	7'-2"	9'-0"	10'-9"	-	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-
	12'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	1'-0"	1'-0"	1'-6"	2'-0"	3'-3"	-
	14'	1'-0"	1'-0"	1'-6"	2'-0"	2'-10"	-	1'-0"	1'-4"	2'-5"	3'-5"	4'-10"	-
	16'	1'-0"	1'-0"	1'-8"	2'-10"	4'-1"	-	1'-6"	2'-9"	3'-11"	5'-2"	6'-5"	-
	18'	1'-0"	1'-5"	2'-0"	4'-1"	5'-6"	-	2'-8"	4'-0"	5'-4"	6'-9"	8'-1"	-
	20'	1'-7"	2'-7"	4'-1"	5'-1"	6'-7"	-	4'-5"	5'-5"	7'-0"	8'-0"	9'-6"	-
	22'	2'-10"	3'-11"	5'-0"	6'-8"	7'-9"	-	5'-5"	7'-1"	8'-3"	9'-11"	-	-
	24'	3'-8"	4'-10"	6'-1"	7'-11"	9'-1"	-	7'-2"	8'-4"	9'-7"	11'-5"	-	-
	26'	5'-3"	6'-7"	7'-11"	9'-2"	10'-6"	-	8'-5"	9'-9"	11'-8"	13'-0"	-	-
	28'	6'-4"	7'-9"	9'-2"	10'-7"	12'-0"	-	10'-6"	11'-11"	13'-4"	-	-	-
	30'	7'-7"	9'-1"	10'-7"	12'-1"	13'-7"	-	12'-0"	13'-6"	15'-0"	-	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"
	12'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-8"	3'-7"
	14'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-3"	1'-0"	1'-0"	2'-0"	3'-1"	4'-2"	5'-3"
	16'	1'-0"	1'-0"	1'-6"	2'-1"	3'-3"	4'-6"	1'-6"	2'-4"	3'-2"	4'-4"	5'-7"	6'-9"
	18'	1'-0"	1'-5"	2'-4"	3'-3"	4'-7"	5'-6"	2'-8"	3'-6"	4'-11"	5'-10"	7'-2"	8'-7"
	20'	1'-7"	2'-7"	3'-7"	4'-7"	5'-7"	7'-1"	3'-11"	4'-11"	6'-6"	7'-6"	8'-6"	10'-0"
	22'	2'-10"	3'-4"	4'-6"	5'-7"	7'-3"	8'-4"	5'-5"	6'-7"	7'-8"	8'-9"	10'-5"	-
	24'	3'-8"	4'-10"	6'-1"	7'-3"	8'-6"	9'-8"	7'-2"	8'-4"	9'-7"	10'-9"	12'-0"	-
	26'	4'-7"	5'-11"	7'-3"	8'-6"	9'-10"	11'-2"	8'-5"	9'-9"	11'-0"	12'-4"	-	-
	28'	6'-4"	7'-1"	8'-6"	9'-11"	11'-3"	12'-8"	9'-9"	11'-2"	12'-7"	14'-0"	-	-
	30'	7'-7"	8'-4"	9'-10"	11'-4"	12'-1"	13'-7"	11'-3"	12'-9"	14'-3"	-	-	-

DESIGN ASSUMPTIONS:

1. The hole locations listed above are valid for joists supporting only uniform loads. The total uniform load must not exceed 130 plf (e.g., 40 psf Live Load and a 25 psf Dead Load, spaced up to 24" oc). The uniform Dead Load must be at least 10 plf.
2. Hole location is measured from the inside face of bearing to the center of a circular hole or obround hole, or to the nearest edge of a rectangular hole, from the closest support.
3. Obround holes are not allowed for LPI 18 Series I-Joists.
4. Maximum hole depth for circular and rectangular holes is Joist Depth less 4", except the maximum hole depth is 6" for 9-1/2" and 8" for 11-7/8" LPI joists. Maximum hole width for rectangular holes is 18". Where the Maximum Hole Dimension for rectangular holes exceeds the maximum hole depth, the dimension refers to hole width and the hole depth is assumed to be the maximum for that joist depth.
5. Holes cannot be located in the span where designated "C", without further analysis by a design professional (see note 8 below).
6. Clear Span has NOT been verified for these joists and is shown for informational purposes only! Verify that the joist selected will work for the span and loading conditions needed before checking hole location.

GENERAL NOTES:

1. **CUT HOLES CAREFULLY! DO NOT OVERCUT HOLES! DO NOT CUT JOIST FLANGES!**
2. Circular and rectangular holes may be placed anywhere within the depth of the joist. A minimum 1/4" clear distance is required between the hole and a flange.
3. Round holes up to 1-1/2" diameter may be placed anywhere in the web.
4. Perforated "knockouts" may be neglected when locating web holes.
5. Holes larger than 1-1/2" are not permitted in cantilevers without special engineering.
6. Multiple holes must have a clear separation along the length of the joist of at least twice the length of the larger adjacent hole, or a minimum of 12" center-to-center, whichever is greater.
7. Multiple holes may be spaced closer provided they fit within the boundary of an acceptable larger hole. Example: two 3" round holes aligned parallel to the joist length may be spaced 2" apart (clear distance) provided that a 3" high by 8" long rectangle or an 8" diameter round hole are acceptable for the joist depth at that location and completely encompass the holes.
8. Larger holes, greater uniform loads or non-uniform loads, and closer proximity to supports and other holes may be possible with further analysis (See DESCRIPTION AND USE Item 4 or the web hole shear equations listed in Table 6).
9. Not all series are available in all depths. Check availability with a local LP Engineered Wood Products distributor
10. **SI Units Conversion: 1 in. = 25.4 mm; 1 ft. = 304.8 mm.**

TABLE 3B – LPI 18 SERIES I-JOISTS HOLE CHART: 40 PSF LIVE LOAD, 25 PSF DEAD LOAD, UP TO 24" OC

Joist Depth	Clear Span	Rectangular Holes
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		Distance from End Support								Distance from Interior Support							
		Maximum Hole Dimension: Depth or Width								Maximum Hole Dimension: Depth or Width							
		2"	4"	6"	8"	10"	12"	14"	16"	2"	4"	6"	8"	10"	12"	14"	16"
9-1/2"	6'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-
	8'	1'-0"	1'-0"	1'-8"	2'-1"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-4"	2'-9"	3'-2"	3'-10"	-	-	-
	10'	1'-0"	1'-7"	2'-10"	3'-4"	3'-10"	4'-4"	4'-10"	-	1'-5"	2'-8"	4'-6"	5'-0"	-	-	-	-
	12'	1'-3"	2'-9"	4'-3"	4'-7"	5'-2"	5'-10"	-	-	2'-11"	4'-6"	6'-0"	-	-	-	-	-
	14'	2'-6"	3'-11"	5'-8"	6'-1"	6'-9"	-	-	-	4'-2"	5'-11"	-	-	-	-	-	-
	16'	3'-8"	5'-3"	6'-11"	7'-4"	-	-	-	-	6'-0"	7'-7"	-	-	-	-	-	-
	18'	4'-7"	6'-5"	8'-2"	-	-	-	-	-	7'-2"	9'-0"	-	-	-	-	-	-
11-7/8"	20'	6'-1"	7'-7"	9'-7"	-	-	-	-	-	9'-0"	-	-	-	-	-	-	-
	6'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-3"	2'-8"	3'-3"	3'-8"	-	1'-0"	1'-0"	2'-2"	3'-7"	4'-0"	-	-	-
	10'	1'-0"	1'-1"	2'-4"	3'-7"	4'-1"	4'-7"	-	-	1'-2"	2'-5"	3'-9"	-	-	-	-	-
	12'	1'-0"	2'-2"	3'-5"	4'-11"	5'-6"	-	-	-	2'-8"	3'-10"	5'-5"	-	-	-	-	-
	14'	2'-2"	3'-3"	4'-8"	6'-5"	6'-9"	-	-	-	4'-2"	5'-7"	7'-0"	-	-	-	-	-
	16'	3'-3"	4'-6"	6'-1"	7'-8"	-	-	-	-	5'-7"	7'-2"	-	-	-	-	-	-
14"	18'	4'-7"	5'-11"	7'-3"	-	-	-	-	-	7'-2"	8'-7"	-	-	-	-	-	-
	20'	5'-7"	7'-1"	9'-1"	-	-	-	-	-	9'-0"	-	-	-	-	-	-	-
	22'	7'-3"	8'-4"	10'-7"	-	-	-	-	-	10'-5"	-	-	-	-	-	-	-
	24'	8'-6"	9'-8"	11'-6"	-	-	-	-	-	12'-0"	-	-	-	-	-	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-9"	3'-5"	4'-0"	-
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-10"	3'-7"	4'-1"	-	1'-0"	1'-0"	1'-6"	2'-5"	4'-3"	5'-0"	-	-
	12'	1'-0"	1'-0"	1'-6"	2'-2"	4'-0"	4'-11"	5'-6"	-	1'-0"	1'-0"	2'-0"	3'-10"	6'-0"	-	-	-
16"	14'	1'-0"	1'-0"	1'-6"	3'-3"	5'-4"	6'-5"	-	-	1'-0"	1'-8"	3'-5"	5'-3"	-	-	-	-
	16'	1'-0"	1'-0"	2'-6"	4'-6"	6'-11"	7'-8"	-	-	1'-6"	3'-2"	4'-9"	6'-9"	-	-	-	-
	18'	1'-0"	1'-10"	3'-8"	5'-11"	8'-2"	-	-	-	2'-8"	4'-5"	6'-3"	8'-7"	-	-	-	-
	20'	1'-7"	3'-1"	5'-1"	7'-1"	9'-7"	-	-	-	3'-11"	6'-0"	8'-0"	10'-0"	-	-	-	-
	22'	2'-10"	4'-6"	6'-2"	8'-4"	-	-	-	-	5'-5"	7'-8"	9'-4"	-	-	-	-	-
	24'	3'-8"	5'-6"	7'-11"	9'-8"	-	-	-	-	7'-2"	9'-0"	11'-5"	-	-	-	-	-
	26'	4'-7"	6'-7"	9'-2"	11'-2"	-	-	-	-	8'-5"	10'-5"	13'-0"	-	-	-	-	-
16"	28'	6'-4"	7'-9"	10'-7"	12'-8"	-	-	-	-	9'-9"	11'-11"	-	-	-	-	-	-
	30'	7'-7"	9'-1"	11'-4"	14'-4"	-	-	-	-	12'-0"	13'-6"	-	-	-	-	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-10"	-	-
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-10"	4'-7"	-	1'-0"	1'-0"	1'-6"	2'-0"	3'-6"	-	-	-
	12'	1'-0"	1'-0"	1'-6"	2'-0"	3'-1"	5'-2"	-	-	1'-0"	1'-0"	1'-6"	3'-3"	5'-1"	-	-	-
	14'	1'-0"	1'-0"	1'-6"	2'-6"	4'-8"	6'-9"	-	-	1'-0"	1'-4"	3'-1"	4'-6"	6'-8"	-	-	-
	16'	1'-0"	1'-0"	2'-1"	4'-1"	5'-8"	-	-	-	1'-1"	2'-9"	4'-4"	6'-5"	-	-	-	-
16"	18'	1'-0"	1'-10"	3'-3"	5'-0"	7'-3"	-	-	-	2'-8"	4'-0"	5'-10"	7'-8"	-	-	-	-
	20'	1'-7"	3'-1"	4'-7"	6'-7"	8'-7"	-	-	-	3'-11"	5'-5"	7'-6"	9'-6"	-	-	-	-
	22'	2'-3"	3'-11"	5'-7"	7'-9"	10'-0"	-	-	-	5'-5"	7'-1"	8'-9"	11'-0"	-	-	-	-
	24'	3'-8"	5'-6"	7'-3"	9'-1"	11'-6"	-	-	-	7'-2"	8'-4"	10'-9"	-	-	-	-	-
	26'	4'-7"	6'-7"	8'-6"	10'-6"	12'-5"	-	-	-	8'-5"	10'-5"	12'-4"	-	-	-	-	-
	28'	5'-8"	7'-9"	9'-11"	12'-0"	-	-	-	-	9'-9"	11'-11"	14'-0"	-	-	-	-	-
	30'	6'-10"	9'-1"	11'-4"	12'-10"	-	-	-	-	11'-3"	13'-6"	-	-	-	-	-	-

DESIGN ASSUMPTIONS:

- The hole locations listed above are valid for joists supporting only uniform loads. The total uniform load must not exceed 130 plf (e.g., 40 psf Live Load and a 25 psf Dead Load, spaced up to 24" oc). The uniform Dead Load must be at least 10 plf.
- Hole location is measured from the inside face of bearing to the center of a circular hole or obround hole, or to the nearest edge of a rectangular hole, from the closest support.
- Obround holes are not allowed in the LPI 18 Series I-Joists.
- Maximum hole depth for circular and rectangular holes is Joist Depth less 4", except the maximum hole depth is 6" for 9-1/2" and 8" for 11-7/8" LPI joists. Maximum hole width for rectangular holes is 18". Where the Maximum Hole Dimension for rectangular holes exceeds the maximum hole depth, the dimension refers to hole width and the hole depth is assumed to be the maximum for that joist depth.
- Holes cannot be located in the span where designated "--", without further analysis by a design professional (see note 8 below).
- Clear Span has NOT been verified for these joists and is shown for informational purposes only! Verify that the joist selected will work for the span and loading conditions needed before checking hole location.

GENERAL NOTES:

- CUT HOLES CAREFULLY! DO NOT OVERCUT HOLES! DO NOT CUT JOIST FLANGES!**
- Circular and rectangular holes may be placed anywhere within the depth of the joist. A minimum 1/4" clear distance is required between the hole and a flange.
- Round holes up to 1-1/2" diameter may be placed anywhere in the web.
- Perforated "knockouts" may be neglected when locating web holes.
- Holes larger than 1-1/2" are not permitted in cantilevers without special engineering.
- Multiple holes must have a clear separation along the length of the joist of at least twice the length of the larger adjacent hole, or a minimum of 12" center-to-center, whichever is greater.
- Multiple holes may be spaced closer provided they fit within the boundary of an acceptable larger hole. Example: two 3" round holes aligned parallel to the joist length may be spaced 2" apart (clear distance) provided that a 3" high by 8" long rectangle or an 8" diameter round hole are acceptable for the joist depth at that location and completely encompass the holes.
- Larger holes, greater uniform loads or non-uniform loads, and closer proximity to supports and other holes may be possible with further analysis (See DESCRIPTION AND USE Item 4 or the web hole shear equations listed in Table 6).
- Not all series are available in all depths. Check availability with a local LP Engineered Wood Products distributor.
- SI Units Conversion:** 1 in. = 25.4 mm; 1 ft. = 304.8 mm.

TABLE 4A. WEB HOLE CHART: 40 PSF LIVE LOAD, 15 PSF DEAD LOAD, UP TO 24" OC (CIRCULAR HOLES)

Joist Depth	Clear Span	Circular Holes (including Obround Holes)													
		Distance from End Support							Distance from Interior Support						
		Hole Diameter						Obround Hole	Hole Diameter						Obround Hole
		2"	4"	6"	8"	10"	12"		2"	4"	6"	8"	10"	12"	
9-1/2"	6'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"
	8'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"
	10'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	1'-0"	1'-6"	-	-	-	1'-11"
	12'	1'-0"	1'-0"	1'-6"	-	-	-	1'-8"	1'-0"	1'-0"	1'-6"	-	-	-	3'-4"
	14'	1'-0"	1'-0"	1'-6"	-	-	-	2'-10"	1'-0"	1'-0"	2'-5"	-	-	-	4'-9"
	16'	1'-0"	1'-0"	1'-8"	-	-	-	4'-0"	1'-0"	1'-6"	3'-7"	-	-	-	6'-4"
	18'	1'-0"	1'-0"	2'-9"	-	-	-	5'-3"	1'-0"	2'-8"	4'-11"	-	-	-	7'-11"
11-7/8"	20'	1'-0"	1'-7"	3'-7"	-	-	-	6'-6"	1'-11"	4'-5"	6'-6"	-	-	-	9'-7"
	6'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"
	8'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"
	10'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-11"
	12'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-8"	1'-0"	1'-0"	1'-6"	2'-0"	-	-	3'-4"
	14'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	2'-10"	1'-0"	1'-0"	1'-6"	2'-9"	-	-	4'-9"
	16'	1'-0"	1'-0"	1'-6"	2'-1"	-	-	4'-0"	1'-0"	1'-0"	2'-4"	3'-11"	-	-	6'-4"
	18'	1'-0"	1'-0"	1'-6"	3'-3"	-	-	5'-3"	1'-0"	2'-2"	3'-6"	5'-10"	-	-	7'-11"
	20'	1'-0"	1'-0"	2'-7"	4'-1"	-	-	6'-6"	1'-5"	3'-5"	4'-11"	7'-0"	-	-	9'-7"
14"	22'	1'-0"	1'-8"	3'-4"	5'-7"	-	-	7'-10"	3'-3"	4'-11"	6'-7"	8'-9"	-	-	11'-3"
	24'	1'-3"	3'-1"	4'-10"	6'-8"	-	-	9'-2"	4'-2"	5'-11"	8'-4"	10'-2"	-	-	13'-0"
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	1'-4"
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	1'-5"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	2'-9"
	12'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	2'-6"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	4'-3"
	14'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	3'-9"	1'-0"	1'-0"	1'-6"	2'-0"	3'-1"	-	5'-9"
	16'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	5'-0"	1'-0"	1'-0"	1'-6"	3'-2"	4'-9"	-	7'-4"
	18'	1'-0"	1'-0"	1'-6"	2'-0"	3'-8"	-	6'-3"	1'-0"	1'-3"	3'-1"	4'-5"	6'-3"	-	9'-0"
	20'	1'-0"	1'-0"	1'-7"	3'-1"	4'-7"	-	7'-7"	1'-5"	2'-11"	4'-5"	6'-0"	7'-6"	-	10'-9"
	22'	1'-0"	1'-2"	2'-10"	4'-6"	6'-2"	-	8'-11"	2'-8"	4'-4"	6'-0"	7'-8"	9'-4"	-	12'-6"
	24'	1'-3"	2'-5"	3'-8"	5'-6"	7'-3"	-	10'-4"	4'-2"	5'-4"	7'-2"	9'-0"	10'-9"	-	14'-3"
16"	26'	2'-0"	3'-4"	5'-3"	6'-7"	8'-6"	-	11'-9"	5'-10"	7'-1"	8'-5"	10'-5"	12'-4"	-	16'-1"
	28'	2'-10"	5'-0"	6'-4"	7'-9"	9'-11"	-	13'-2"	6'-11"	8'-4"	10'-6"	11'-11"	14'-0"	-	18'-0"
	30'	4'-7"	6'-1"	7'-7"	9'-1"	11'-4"	-	14'-8"	8'-2"	9'-9"	12'-0"	13'-6"	-	-	19'-11"
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	1'-11"
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	1'-11"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-4"
	12'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-1"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	4'-10"
	14'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	4'-4"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-5"	6'-5"
	16'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	5'-7"	1'-0"	1'-0"	1'-6"	2'-4"	3'-7"	5'-2"	8'-1"
	18'	1'-0"	1'-0"	1'-6"	2'-0"	2'-9"	4'-1"	6'-11"	1'-0"	1'-3"	2'-2"	3'-6"	4'-11"	6'-9"	9'-9"
	20'	1'-0"	1'-0"	1'-6"	2'-7"	3'-7"	5'-1"	8'-4"	1'-5"	2'-5"	3'-11"	4'-11"	6'-6"	8'-0"	11'-6"
	22'	1'-0"	1'-2"	2'-3"	3'-4"	5'-0"	6'-8"	9'-9"	2'-8"	3'-9"	4'-11"	6'-7"	8'-3"	9'-11"	13'-4"
	24'	1'-0"	1'-10"	3'-1"	4'-10"	6'-1"	7'-11"	11'-2"	4'-2"	5'-4"	6'-7"	8'-4"	9'-7"	11'-5"	15'-2"
16"	26'	2'-0"	3'-4"	4'-7"	5'-11"	7'-3"	9'-2"	12'-7"	5'-2"	6'-5"	8'-5"	9'-9"	11'-0"	13'-0"	17'-1"
	28'	2'-10"	4'-3"	5'-8"	7'-1"	8'-6"	10'-7"	14'-1"	6'-11"	8'-4"	9'-9"	11'-2"	12'-7"	-	19'-0"
	30'	3'-10"	5'-4"	6'-10"	8'-4"	9'-10"	12'-1"	15'-6"	8'-2"	9'-9"	11'-3"	12'-9"	14'-3"	-	21'-0"

DESIGN ASSUMPTIONS:

- The hole locations listed above are valid for joists supporting only uniform loads. The total uniform load must not exceed 110 plf (e.g., 40 psf Live Load and a 15 psf Dead Load, spaced up to 24" oc). The uniform Dead Load must be at least 10 plf.
- Hole location is measured from the inside face of bearing to the center of a circular or obround hole, or to the nearest edge of a rectangular hole, from the closest support.
- Obround holes are (up to) full web-depth holes with semi-circular ends defined by three overlapping circular holes spaced up to 1-1/2" apart, center-to-center of holes.
- Maximum hole depth for circular and rectangular holes is Joist Depth less 4", except the maximum hole depth is 6" for 9-1/2" and 8" for 11-7/8" LPI joists. Maximum hole width for rectangular holes is 18". Where the Maximum Hole Dimension for rectangular holes exceeds the maximum hole depth, the dimension refers to hole width and the hole depth is assumed to be the maximum for that joist depth.
- Holes cannot be located in the span where designated "-", without further analysis by a design professional (see note 8 below).
- Clear Span has NOT been verified for these joists and is shown for informational purposes only! Verify that the joist selected will work for the span and loading conditions needed before checking hole location.

GENERAL NOTES:

- CUT HOLES CAREFULLY! DO NOT OVERCUT HOLES! DO NOT CUT JOIST FLANGES!**
- Circular and rectangular holes may be placed anywhere within the depth of the joist. A minimum 1/4" clear distance is required between the hole and a flange. Obround holes may be up to full web-depth.
- Round holes up to 1-1/2" diameter may be placed anywhere in the web.
- Perforated "knockouts" may be neglected when locating web holes.
- Holes larger than 1-1/2" are not permitted in cantilevers without special engineering.
- Multiple holes must have a clear separation along the length of the joist of at least twice the length of the larger adjacent hole, or a minimum of 12" center-to-center, whichever is greater. **Exception:** adjacent obround holes may be spaced as close as 24" clear distance between holes.
- Multiple holes may be spaced closer provided they fit within the boundary of an acceptable larger hole. Example: two 3" round holes aligned parallel to the joist length may be spaced 2" apart (clear distance) provided that a 3" high by 8" long rectangle or an 8" diameter round hole are acceptable for the joist depth at that location and completely encompass the holes.
- Larger holes, greater uniform loads or non-uniform loads, and closer proximity to supports and other holes may be possible with further analysis (See DESCRIPTION AND USE Item 4 or the web hole shear equations listed in Table 7).
- Not all series are available in all depths. Check availability with a local LP Engineered Wood Products distributor.
- SI Units Conversion:** 1 in. = 25.4 mm; 1 ft. = 304.8 mm.

TABLE 4B. WEB HOLE CHART: 40 PSF LIVE LOAD, 15 PSF DEAD LOAD, UP TO 24" OC (RECTANGULAR HOLES)

Joist Depth	Clear Span	Rectangular Holes														
		Distance from End Support								Distance from Interior Support						
		Max. Hole Dimension: Depth or Width								Max. Hole Dimension: Depth or Width						
		2"	4"	6"	8"	10"	12"	14"	16"	2"	4"	6"	8"	10"	12"	14"
9-1/2"	6'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	1'-11"	2'-4"	2'-9"	3'-5"	4'-0"
	10'	1'-0"	1'-0"	1'-10"	2'-4"	3'-1"	3'-7"	4'-1"	4'-10"	1'-0"	1'-5"	3'-3"	4'-0"	4'-6"	5'-0"	-
	12'	1'-0"	1'-3"	3'-1"	3'-8"	4'-3"	4'-11"	5'-6"	-	1'-1"	2'-11"	4'-9"	5'-5"	6'-0"	-	-
	14'	1'-0"	2'-6"	4'-3"	5'-0"	5'-8"	6'-5"	-	-	2'-5"	4'-6"	6'-8"	7'-0"	-	-	-
	16'	1'-8"	3'-8"	5'-8"	6'-6"	6'-11"	7'-8"	-	-	3'-11"	6'-0"	8'-0"	-	-	-	-
	18'	2'-9"	5'-0"	6'-10"	7'-9"	8'-2"	-	-	-	5'-4"	7'-8"	-	-	-	-	-
	20'	4'-1"	6'-1"	8'-7"	9'-1"	9'-7"	-	-	-	7'-0"	9'-0"	-	-	-	-	-
11-7/8"	6'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	1'-6"	2'-7"	3'-2"	3'-10"	-
	10'	1'-0"	1'-0"	1'-6"	2'-10"	3'-4"	3'-10"	4'-7"	-	1'-0"	1'-0"	2'-5"	4'-3"	4'-9"	-	-
	12'	1'-0"	1'-0"	2'-2"	4'-0"	4'-7"	5'-2"	5'-10"	-	1'-0"	2'-4"	3'-10"	5'-8"	-	-	-
	14'	1'-0"	1'-10"	3'-7"	5'-4"	6'-1"	6'-9"	-	-	2'-5"	3'-10"	5'-7"	-	-	-	-
	16'	1'-8"	2'-10"	4'-11"	6'-11"	7'-4"	-	-	-	3'-7"	5'-2"	7'-2"	-	-	-	-
	18'	2'-9"	4'-1"	5'-11"	8'-2"	8'-8"	-	-	-	4'-11"	6'-9"	8'-7"	-	-	-	-
	20'	4'-1"	5'-7"	7'-7"	9'-7"	-	-	-	-	6'-6"	8'-6"	-	-	-	-	-
14"	22'	5'-0"	6'-8"	8'-11"	-	-	-	-	-	8'-3"	9'-11"	-	-	-	-	-
	24'	6'-1"	7'-11"	10'-4"	-	-	-	-	-	9'-7"	11'-5"	-	-	-	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-4"	1'-0"	1'-0"	1'-6"	2'-0"	3'-3"	4'-0"	5'-0"
	12'	1'-0"	1'-0"	1'-6"	2'-0"	3'-1"	4'-0"	4'-11"	5'-10"	1'-0"	1'-0"	1'-6"	2'-4"	4'-9"	5'-8"	-
	14'	1'-0"	1'-0"	1'-6"	2'-0"	4'-3"	5'-4"	6'-1"	-	1'-0"	1'-0"	1'-6"	3'-10"	6'-3"	-	-
	16'	1'-0"	1'-0"	1'-6"	2'-10"	5'-8"	6'-6"	7'-8"	-	1'-0"	1'-0"	2'-9"	5'-2"	8'-0"	-	-
	18'	1'-0"	1'-0"	1'-10"	4'-1"	6'-10"	7'-9"	-	-	1'-0"	2'-2"	4'-5"	6'-9"	-	-	-
16"	20'	1'-0"	1'-0"	3'-1"	5'-7"	8'-1"	9'-1"	-	-	1'-5"	3'-5"	6'-0"	8'-6"	-	-	-
	22'	1'-0"	1'-8"	3'-11"	6'-8"	9'-5"	10'-7"	-	-	2'-8"	4'-11"	7'-1"	9'-11"	-	-	-
	24'	1'-0"	3'-1"	5'-6"	7'-11"	10'-11"	-	-	-	4'-2"	5'-11"	9'-0"	11'-5"	-	-	-
	26'	2'-0"	4'-0"	6'-7"	9'-2"	12'-5"	-	-	-	5'-2"	7'-9"	10'-5"	13'-0"	-	-	-
	28'	2'-10"	5'-0"	7'-9"	10'-7"	-	-	-	-	6'-11"	9'-1"	11'-11"	-	-	-	-
	30'	3'-10"	6'-10"	9'-1"	12'-1"	-	-	-	-	8'-2"	10'-6"	13'-6"	-	-	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-10"
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-1"	3'-10"	4'-10"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	4'-6"	-
16"	12'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	4'-3"	5'-2"	-	1'-0"	1'-0"	1'-6"	2'-0"	3'-7"	-	-
	14'	1'-0"	1'-0"	1'-6"	2'-0"	3'-3"	5'-8"	6'-9"	-	1'-0"	1'-0"	1'-6"	3'-1"	5'-3"	-	-
	16'	1'-0"	1'-0"	1'-6"	2'-1"	4'-6"	6'-11"	-	-	1'-0"	1'-0"	2'-4"	4'-4"	6'-9"	-	-
	18'	1'-0"	1'-0"	1'-6"	3'-3"	5'-6"	8'-8"	-	-	1'-0"	1'-9"	3'-6"	5'-10"	8'-7"	-	-
	20'	1'-0"	1'-0"	2'-7"	4'-7"	7'-1"	-	-	-	1'-0"	2'-11"	4'-11"	7'-6"	10'-0"	-	-
	22'	1'-0"	1'-8"	3'-4"	5'-7"	8'-4"	-	-	-	2'-8"	4'-4"	6'-7"	8'-9"	-	-	-
	24'	1'-0"	2'-5"	4'-10"	7'-3"	9'-8"	-	-	-	3'-6"	5'-11"	7'-9"	10'-9"	-	-	-
	26'	2'-0"	4'-0"	5'-11"	8'-6"	11'-2"	-	-	-	5'-2"	7'-1"	9'-9"	12'-4"	-	-	-
16"	28'	2'-10"	5'-0"	7'-1"	9'-11"	12'-8"	-	-	-	6'-3"	9'-1"	11'-2"	14'-0"	-	-	-
	30'	3'-10"	6'-1"	8'-4"	10'-7"	13'-7"	-	-	-	8'-2"	10'-6"	12'-9"	-	-	-	-

DESIGN ASSUMPTIONS:

- The hole locations listed above are valid for joists supporting only uniform loads. The total uniform load must not exceed 110 plf (e.g., 40 psf Live Load and a 15 psf Dead Load, spaced up to 24" oc). The uniform Dead Load must be at least 10 plf.
- Hole location is measured from the inside face of bearing to the center of a circular or obround hole, or to the nearest edge of a rectangular hole, from the closest support.
- Obround holes are (up to) full web-depth holes with semi-circular ends defined by three overlapping circular holes spaced up to 1-1/2" apart, center-to-center of holes.
- Maximum hole depth for circular and rectangular holes is Joist Depth less 4", except the maximum hole depth is 6" for 9-1/2" and 8" for 11-7/8" LPI joists. Maximum hole width for rectangular holes is 18". Where the Maximum Hole Dimension for rectangular holes exceeds the maximum hole depth, the dimension refers to hole width and the hole depth is assumed to be the maximum for that joist depth.
- Holes cannot be located in the span where designated "-," without further analysis by a design professional (see note 8 below).
- Clear Span has NOT been verified for these joists and is shown for informational purposes only! Verify that the joist selected will work for the span and loading conditions needed before checking hole location.

GENERAL NOTES:

- CUT HOLES CAREFULLY! DO NOT OVERCUT HOLES! DO NOT CUT JOIST FLANGES!**
- Circular and rectangular holes may be placed anywhere within the depth of the joist. A minimum 1/4" clear distance is required between the hole and a flange. Obround holes may be up to full web-depth.
- Round holes up to 1-1/2" diameter may be placed anywhere in the web.
- Perforated "knockouts" may be neglected when locating web holes.
- Holes larger than 1-1/2" are not permitted in cantilevers without special engineering.
- Multiple holes must have a clear separation along the length of the joist of at least twice the length of the larger adjacent hole, or a minimum of 12" center-to-center, whichever is greater. **Exception:** adjacent obround holes may be spaced as close as 24" clear distance between holes.
- Multiple holes may be spaced closer provided they fit within the boundary of an acceptable larger hole. Example: two 3" round holes aligned parallel to the joist length may be spaced 2" apart (clear distance) provided that a 3" high by 8" long rectangle or an 8" diameter round hole are acceptable for the joist depth at that location and completely encompass the holes.
- Larger holes, greater uniform loads or non-uniform loads, and closer proximity to supports and other holes may be possible with further analysis (See DESCRIPTION AND USE Item 4 or the web hole shear equations listed in Table 7).
- Not all series are available in all depths. Check availability with a local LP Engineered Wood Products distributor.
- SI Units Conversion: 1 in. = 25.4 mm; 1 ft. = 304.8 mm.

TABLE 5A. WEB HOLE CHART: 40 PSF LIVE LOAD, 25 PSF DEAD LOAD, UP TO 24" OC (CIRCULAR HOLES)

Joist Depth	Clear Span	Circular Holes (including Obround Holes)													
		Distance from End Support							Distance from Interior Support						
		Hole Diameter						Obround Hole	Hole Diameter						Obround Hole
		2"	4"	6"	8"	10"	12"		2"	4"	6"	8"	10"	12"	
9-1/2"	6'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"
	8'	1'-0"	1'-0"	1'-6"	-	-	-	1'-0"	1'-0"	1'-0"	1'-6"	-	-	-	1'-4"
	10'	1'-0"	1'-0"	1'-6"	-	-	-	1'-5"	1'-0"	1'-0"	1'-6"	-	-	-	2'-9"
	12'	1'-0"	1'-0"	1'-6"	-	-	-	2'-6"	1'-0"	1'-0"	2'-0"	-	-	-	4'-3"
	14'	1'-0"	1'-0"	1'-6"	-	-	-	3'-9"	1'-0"	1'-8"	3'-5"	-	-	-	5'-9"
	16'	1'-0"	1'-0"	2'-10"	-	-	-	5'-0"	1'-1"	3'-2"	4'-9"	-	-	-	7'-5"
	18'	1'-0"	1'-10"	3'-8"	-	-	-	6'-4"	2'-8"	4'-5"	6'-3"	-	-	-	9'-1"
	20'	1'-1"	3'-1"	5'-1"	-	-	-	7'-8"	3'-11"	6'-0"	8'-0"	-	-	-	10'-10"
11-7/8"	6'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"
	8'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-5"
	10'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	1'-5"	1'-0"	1'-0"	1'-6"	2'-0"	-	-	2'-9"
	12'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	2'-7"	1'-0"	1'-0"	1'-6"	2'-4"	-	-	4'-3"
	14'	1'-0"	1'-0"	1'-6"	2'-0"	-	-	3'-9"	1'-0"	1'-0"	2'-5"	3'-10"	-	-	5'-10"
	16'	1'-0"	1'-0"	1'-8"	3'-3"	-	-	5'-0"	1'-0"	2'-4"	3'-7"	5'-2"	-	-	7'-5"
	18'	1'-0"	1'-5"	2'-9"	4'-1"	-	-	6'-4"	2'-2"	3'-6"	5'-4"	6'-9"	-	-	9'-1"
	20'	1'-1"	2'-1"	4'-1"	5'-7"	-	-	7'-8"	3'-5"	4'-11"	6'-6"	8'-6"	-	-	10'-10"
	22'	1'-8"	3'-4"	5'-0"	6'-8"	-	-	9'-0"	4'-11"	6'-7"	8'-3"	9'-11"	-	-	12'-7"
	24'	3'-1"	4'-10"	6'-1"	7'-11"	-	-	10'-5"	6'-7"	7'-9"	9'-7"	12'-0"	-	-	14'-5"
14"	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	2'-1"
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	2'-2"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	3'-7"
	12'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	3'-4"	1'-0"	1'-0"	1'-6"	2'-0"	2'-8"	-	5'-1"
	14'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	-	4'-7"	1'-0"	1'-0"	1'-8"	2'-9"	4'-2"	-	6'-8"
	16'	1'-0"	1'-0"	1'-6"	2'-1"	3'-8"	-	5'-11"	1'-0"	1'-11"	3'-2"	4'-4"	5'-7"	-	8'-4"
	18'	1'-0"	1'-0"	1'-10"	3'-3"	4'-7"	-	7'-3"	1'-9"	3'-1"	4'-5"	5'-10"	7'-2"	-	10'-1"
	20'	1'-0"	2'-1"	3'-1"	4'-7"	6'-1"	-	8'-8"	3'-5"	4'-5"	6'-0"	7'-6"	9'-0"	-	11'-11"
	22'	1'-8"	2'-10"	4'-6"	5'-7"	7'-3"	-	10'-1"	4'-11"	6'-0"	7'-8"	8'-9"	10'-5"	-	13'-9"
	24'	3'-1"	4'-3"	5'-6"	7'-3"	8'-6"	-	11'-6"	5'-11"	7'-9"	9'-0"	10'-9"	12'-0"	-	15'-7"
	26'	4'-0"	5'-3"	6'-7"	8'-6"	9'-10"	-	12'-11"	7'-9"	9'-1"	10'-5"	12'-4"	-	-	17'-7"
	28'	5'-0"	6'-4"	7'-9"	9'-11"	11'-3"	-	14'-5"	9'-1"	10'-6"	11'-11"	14'-0"	-	-	19'-6"
	30'	6'-1"	7'-7"	9'-1"	10'-7"	12'-10"	-	15'-11"	10'-6"	12'-0"	13'-6"	-	-	-	21'-6"
16"	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	1'-6"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	2'-7"
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	2'-8"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	4'-1"
	12'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-11"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-3"	5'-8"
	14'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	5'-2"	1'-0"	1'-0"	1'-6"	2'-5"	3'-5"	4'-6"	7'-4"
	16'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-8"	6'-6"	1'-0"	1'-6"	2'-9"	3'-7"	4'-9"	6'-0"	9'-1"
	18'	1'-0"	1'-0"	1'-6"	2'-9"	3'-8"	5'-0"	7'-11"	1'-9"	2'-8"	4'-0"	4'-11"	6'-3"	7'-8"	10'-10"
	20'	1'-0"	1'-7"	2'-7"	3'-7"	5'-1"	6'-7"	9'-4"	2'-11"	4'-5"	5'-5"	6'-6"	8'-0"	9'-6"	12'-8"
	22'	1'-8"	2'-10"	3'-11"	5'-0"	6'-2"	7'-9"	10'-9"	4'-4"	5'-5"	7'-1"	8'-3"	9'-4"	11'-0"	14'-7"
	24'	2'-5"	3'-8"	4'-10"	6'-1"	7'-11"	9'-1"	12'-3"	5'-11"	7'-2"	8'-4"	9'-7"	11'-5"	-	16'-6"
	26'	4'-0"	5'-3"	5'-11"	7'-3"	9'-2"	10'-6"	13'-9"	7'-1"	8'-5"	9'-9"	11'-0"	13'-0"	-	18'-6"
	28'	5'-0"	6'-4"	7'-9"	8'-6"	9'-11"	12'-0"	15'-3"	9'-1"	10'-6"	11'-2"	13'-4"	-	-	20'-6"
	30'	6'-1"	7'-7"	9'-1"	9'-10"	11'-4"	12'-10"	16'-9"	10'-6"	12'-0"	12'-9"	14'-3"	-	-	22'-7"

DESIGN ASSUMPTIONS:

- The hole locations listed above are valid for joists supporting only uniform loads. The total uniform load must not exceed 130 plf (e.g., 40 psf Live Load and a 25 psf Dead Load, spaced up to 24" oc). The uniform Dead Load must be at least 10 plf.
- Hole location is measured from the inside face of bearing to the center of a circular or obround hole, or to the nearest edge of a rectangular hole, from the closest support.
- Obround holes are (up to) full web-depth holes with semi-circular ends defined by three overlapping circular holes spaced up to 1-1/2" apart, center-to-center of holes.
- Maximum hole depth for circular and rectangular holes is Joist Depth less 4", except the maximum hole depth is 6" for 9-1/2" and 8" for 11-7/8" LPI joists. Maximum hole width for rectangular holes is 18". Where the Maximum Hole Dimension for rectangular holes exceeds the maximum hole depth, the dimension refers to hole width and the hole depth is assumed to be the maximum for that joist depth.
- Holes cannot be located in the span where designated "--", without further analysis by a design professional (see note 8 below).
- Clear Span has NOT been verified for these joists and is shown for informational purposes only! Verify that the joist selected will work for the span and loading conditions needed before checking hole location.

GENERAL NOTES:

- CUT HOLES CAREFULLY! DO NOT OVERCUT HOLES! DO NOT CUT JOIST FLANGES!**
- Circular and rectangular holes may be placed anywhere within the depth of the joist. A minimum 1/4" clear distance is required between the hole and a flange. Obround holes may be up to full web-depth.
- Round holes up to 1-1/2" diameter may be placed anywhere in the web.
- Perforated "knockouts" may be neglected when locating web holes.
- Holes larger than 1-1/2" are not permitted in cantilevers without special engineering.
- Multiple holes must have a clear separation along the length of the joist of at least twice the length of the larger adjacent hole, or a minimum of 12" center-to-center, whichever is greater. **Exception:** adjacent obround holes may be spaced as close as 24" clear distance between holes.
- Multiple holes may be spaced closer provided they fit within the boundary of an acceptable larger hole. Example: two 3" round holes aligned parallel to the joist length may be spaced 2" apart (clear distance) provided that a 3" high by 8" long rectangle or an 8" diameter round hole are acceptable for the joist depth at that location and completely encompass the holes.
- Larger holes, greater uniform loads or non-uniform loads, and closer proximity to supports and other holes may be possible with further analysis (See DESCRIPTION AND USE Item 4 or the web hole shear equations listed in Table 7).
- Not all series are available in all depths. Check availability with a local LP Engineered Wood Products distributor.
- SI Units Conversion: 1 in. = 25.4 mm; 1 ft. = 304.8 mm.

TABLE 5B. WEB HOLE CHART: 40 PSF LIVE LOAD, 25 PSF DEAD LOAD, UP TO 24" OC (RECTANGULAR HOLES)

Joist Depth	Clear Span	Rectangular Holes														
		Distance from End Support								Distance from Interior Support						
		Max. Hole Dimension: Depth or Width								Max. Hole Dimension: Depth or Width						
		2"	4"	6"	8"	10"	12"	14"	16"	2"	4"	6"	8"	10"	12"	14"
9-1/2"	6'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	2'-7"	3'-0"	3'-5"	4'-0"	-
	10'	1'-0"	1'-1"	2'-7"	3'-1"	3'-7"	4'-1"	4'-7"	-	1'-0"	2'-5"	4'-0"	4'-6"	5'-0"	-	-
	12'	1'-0"	2'-2"	4'-0"	4'-3"	4'-11"	5'-6"	-	-	2'-4"	3'-10"	5'-8"	-	-	-	-
	14'	1'-10"	3'-3"	5'-4"	5'-8"	6'-5"	6'-9"	-	-	3'-10"	5'-3"	-	-	-	-	-
	16'	2'-10"	4'-6"	6'-6"	6'-11"	7'-8"	-	-	-	5'-2"	6'-9"	-	-	-	-	-
	18'	4'-1"	5'-11"	7'-9"	8'-8"	-	-	-	-	6'-9"	8'-7"	-	-	-	-	-
	20'	5'-7"	7'-1"	9'-1"	-	-	-	-	-	8'-6"	-	-	-	-	-	-
11-7/8"	6'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	-
	8'	1'-0"	1'-0"	1'-6"	2'-1"	2'-6"	3'-1"	3'-6"	-	1'-0"	1'-0"	1'-9"	3'-2"	3'-7"	-	-
	10'	1'-0"	1'-0"	1'-10"	3'-4"	3'-10"	4'-4"	4'-10"	-	1'-0"	1'-11"	3'-3"	4'-9"	-	-	-
	12'	1'-0"	1'-7"	3'-1"	4'-7"	5'-2"	5'-10"	-	-	2'-0"	3'-3"	4'-9"	-	-	-	-
	14'	1'-5"	2'-10"	4'-3"	6'-1"	6'-9"	-	-	-	3'-5"	4'-10"	6'-3"	-	-	-	-
	16'	2'-10"	4'-1"	5'-8"	7'-4"	-	-	-	-	4'-9"	6'-5"	8'-0"	-	-	-	-
	18'	3'-8"	5'-6"	6'-10"	8'-8"	-	-	-	-	6'-3"	8'-1"	-	-	-	-	-
	20'	5'-1"	6'-7"	8'-7"	-	-	-	-	-	8'-0"	9'-6"	-	-	-	-	-
14"	22'	6'-2"	7'-9"	10'-0"	-	-	-	-	-	9'-4"	-	-	-	-	-	-
	24'	7'-11"	9'-1"	10'-11"	-	-	-	-	-	11'-5"	-	-	-	-	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-10"
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-7"	3'-1"	3'-10"	4'-10"	1'-0"	1'-0"	1'-6"	2'-0"	4'-0"	4'-9"	-
	12'	1'-0"	1'-0"	1'-6"	2'-0"	3'-8"	4'-7"	5'-2"	-	1'-0"	1'-0"	1'-6"	3'-3"	5'-5"	-	-
	14'	1'-0"	1'-0"	1'-6"	2'-10"	5'-0"	5'-8"	6'-9"	-	1'-0"	1'-0"	2'-9"	4'-10"	-	-	-
	16'	1'-0"	1'-0"	2'-1"	4'-1"	6'-6"	7'-4"	-	-	1'-0"	2'-4"	4'-4"	6'-5"	-	-	-
	18'	1'-0"	1'-5"	3'-3"	5'-6"	7'-9"	8'-8"	-	-	1'-9"	3'-6"	5'-10"	8'-1"	-	-	-
	20'	1'-0"	2'-7"	4'-7"	6'-7"	9'-1"	-	-	-	2'-11"	4'-11"	7'-0"	9'-6"	-	-	-
	22'	1'-8"	3'-4"	5'-7"	7'-9"	10'-7"	-	-	-	4'-4"	6'-7"	8'-9"	11'-0"	-	-	-
	24'	2'-5"	4'-10"	6'-8"	9'-1"	-	-	-	-	5'-11"	7'-9"	10'-2"	-	-	-	-
	26'	4'-0"	5'-11"	7'-11"	10'-6"	-	-	-	-	7'-9"	9'-9"	11'-8"	-	-	-	-
16"	28'	5'-0"	7'-1"	9'-2"	12'-0"	-	-	-	-	9'-1"	11'-2"	13'-4"	-	-	-	-
	30'	6'-1"	8'-4"	10'-7"	13'-7"	-	-	-	-	10'-6"	12'-9"	15'-0"	-	-	-	-
	8'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-5"	-
	10'	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-7"	4'-4"	-	1'-0"	1'-0"	1'-6"	2'-0"	2'-11"	5'-0"	-
	12'	1'-0"	1'-0"	1'-6"	2'-0"	2'-9"	4'-11"	5'-10"	-	1'-0"	1'-0"	1'-6"	2'-8"	4'-6"	-	-
	14'	1'-0"	1'-0"	1'-6"	2'-2"	3'-11"	6'-5"	-	-	1'-0"	1'-0"	2'-5"	4'-2"	5'-11"	-	-
	16'	1'-0"	1'-0"	1'-8"	3'-3"	5'-3"	7'-8"	-	-	1'-0"	1'-11"	3'-7"	5'-7"	7'-7"	-	-
	18'	1'-0"	1'-0"	2'-9"	4'-7"	6'-10"	-	-	-	1'-9"	3'-6"	4'-11"	7'-2"	-	-	-
	20'	1'-0"	2'-1"	3'-7"	5'-7"	8'-1"	-	-	-	2'-11"	4'-11"	6'-6"	8'-6"	-	-	-
	22'	1'-8"	3'-4"	5'-0"	7'-3"	9'-5"	-	-	-	4'-4"	6'-0"	8'-3"	10'-5"	-	-	-
	24'	2'-5"	4'-3"	6'-1"	8'-6"	10'-11"	-	-	-	5'-11"	7'-9"	9'-7"	12'-0"	-	-	-
	26'	4'-0"	5'-3"	7'-3"	9'-10"	12'-5"	-	-	-	7'-1"	9'-1"	11'-0"	-	-	-	-
	28'	5'-0"	7'-1"	8'-6"	11'-3"	13'-5"	-	-	-	9'-1"	10'-6"	12'-7"	-	-	-	-
	30'	6'-1"	8'-4"	9'-10"	12'-1"	-	-	-	-	10'-6"	12'-0"	14'-3"	-	-	-	-

DESIGN ASSUMPTIONS:

- The hole locations listed above are valid for joists supporting only uniform loads. The total uniform load must not exceed 130 plf (e.g., 40 psf Live Load and a 25 psf Dead Load, spaced up to 24" oc). The uniform Dead Load must be at least 10 plf.
- Hole location is measured from the inside face of bearing to the center of a circular or obround hole, or to the nearest edge of a rectangular hole, from the closest support.
- Obround holes are (up to) full web-depth holes with semi-circular ends defined by three overlapping circular holes spaced up to 1-1/2" apart, center-to-center of holes.
- Maximum hole depth for circular and rectangular holes is Joist Depth less 4", except the maximum hole depth is 6" for 9-1/2" and 8" for 11-7/8" LPI joists. Maximum hole width for rectangular holes is 18". Where the Maximum Hole Dimension for rectangular holes exceeds the maximum hole depth, the dimension refers to hole width and the hole depth is assumed to be the maximum for that joist depth.
- Holes cannot be located in the span where designated "--", without further analysis by a design professional (see note 8 below).
- Clear Span has NOT been verified for these joists and is shown for informational purposes only! Verify that the joist selected will work for the span and loading conditions needed before checking hole location.

GENERAL NOTES:

- CUT HOLES CAREFULLY! DO NOT OVERCUT HOLES! DO NOT CUT JOIST FLANGES!**
- Circular and rectangular holes may be placed anywhere within the depth of the joist. A minimum 1/4" clear distance is required between the hole and a flange. Obround holes may be up to full web-depth.
- Round holes up to 1-1/2" diameter may be placed anywhere in the web.
- Perforated "knockouts" may be neglected when locating web holes.
- Holes larger than 1-1/2" are not permitted in cantilevers without special engineering.
- Multiple holes must have a clear separation along the length of the joist of at least twice the length of the larger adjacent hole, or a minimum of 12" center-to-center, whichever is greater. **Exception:** adjacent obround holes may be spaced as close as 24" clear distance between holes.
- Multiple holes may be spaced closer provided they fit within the boundary of an acceptable larger hole. Example: two 3" round holes aligned parallel to the joist length may be spaced 2" apart (clear distance) provided that a 3" high by 8" long rectangle or an 8" diameter round hole are acceptable for the joist depth at that location and completely encompass the holes.
- Larger holes, greater uniform loads or non-uniform loads, and closer proximity to supports and other holes may be possible with further analysis (See DESCRIPTION AND USE Item 4 or the web hole shear equations listed in Table 7).
- Not all series are available in all depths. Check availability with a local LP Engineered Wood Products distributor
- SI Units Conversion:** 1 in. = 25.4 mm; 1 ft. = 304.8 mm.

TABLE 6 – LPI 18 SERIES I-JOISTS WEB HOLE EQUATIONS
(May be used in lieu of the web hole charts)

General Equation Form for Circular and Rectangular Holes:

$$\text{Allowable Web Hole Shear (lbs)} = C1 * (D - H)/D + C2 * W + C3$$

Where: D = Joist Depth (in.)
H = Hole Height (in.)
W = Hole Width (in.)

Equation Constants:

Circular Holes			
Joist	Equation Constants		
Depth	C1	C2	C3
<= 16"	946	0	328
Rectangular Holes			
Joist	Equation Constants		
Depth	C1	C2	C3
9.5	554	-20.4	256
11.875	554	-20.4	256
14	977	-30.7	375
16	977	-30.7	375

DESIGN ASSUMPTIONS (SEE TABLES 2 AND 3 FOR MORE DESIGN ASSUMPTIONS):

1. The Allowable Web Hole Shear calculated from above is for normal load duration and can be adjusted for other durations.
2. The critical location for web hole shear is at the center of a circular hole, or at either edge of a rectangular hole.
3. Obround holes are not allowed in the LPI 18 series.
4. Maximum hole depth for circular and rectangular holes is Joist Depth less 4", except the maximum hole depth is 6" for 9-1/2" and 8" for 11-7/8" LPI joists. The maximum hole width for rectangular holes is 18". Where the Maximum Hole Dimension for rectangular holes exceeds the maximum hole depth, the dimension refers to hole width and the hole depth is assumed to be the maximum for that joist depth.
5. Holes cannot be located any closer than 1' or 3 times the length of the hole from the inside face of the closest bearing, without further analysis by a design professional.

FOR GENERAL NOTES, SEE TABLES 2 AND 3.

TABLE 7. WEB HOLE EQUATIONS
(May be used in lieu of the web hole charts)

General Equation Form for Circular and Rectangular Holes:

$$\text{Allowable Web Hole Shear (lbs)} = C1 * (D - H)/D + C2 * W + C3$$

Where: D = Joist Depth (in.)

H = Hole Height (in.)

W = Hole Width (in.)

Equation Constants:

Circular Holes			
Joist Depth	Equation Constants		
	C1	C2	C3
<= 16"	1041	0	361
Rectangular Holes			
Joist Depth	Equation Constants		
	C1	C2	C3
9-1/2"	610	-22.4	282
11-7/8"	610	-22.4	282
14"	1075	-33.8	413
16"	1075	-33.8	413

Allowable Web Hole Shear for Obround Holes:

Joist Depth	Shear (lbs)
9-1/2"	533
11-7/8"	541
14"	469
16"	424

DESIGN ASSUMPTIONS (SEE TABLES 4 AND 5 FOR MORE DESIGN ASSUMPTIONS):

1. The Allowable Web Hole Shear calculated from above is for normal load duration and can be adjusted for other durations.
2. The critical location for web hole shear is at the center of a circular hole, or at either edge of a rectangular or obround hole.
3. Holes cannot be located any closer than 1' or 3 times the length of the hole from the inside face of the closest bearing, without further analysis by a design professional.

FOR GENERAL NOTES, SEE TABLES 4 AND 5.

FIGURE 1. WEB HOLE DRAWINGS

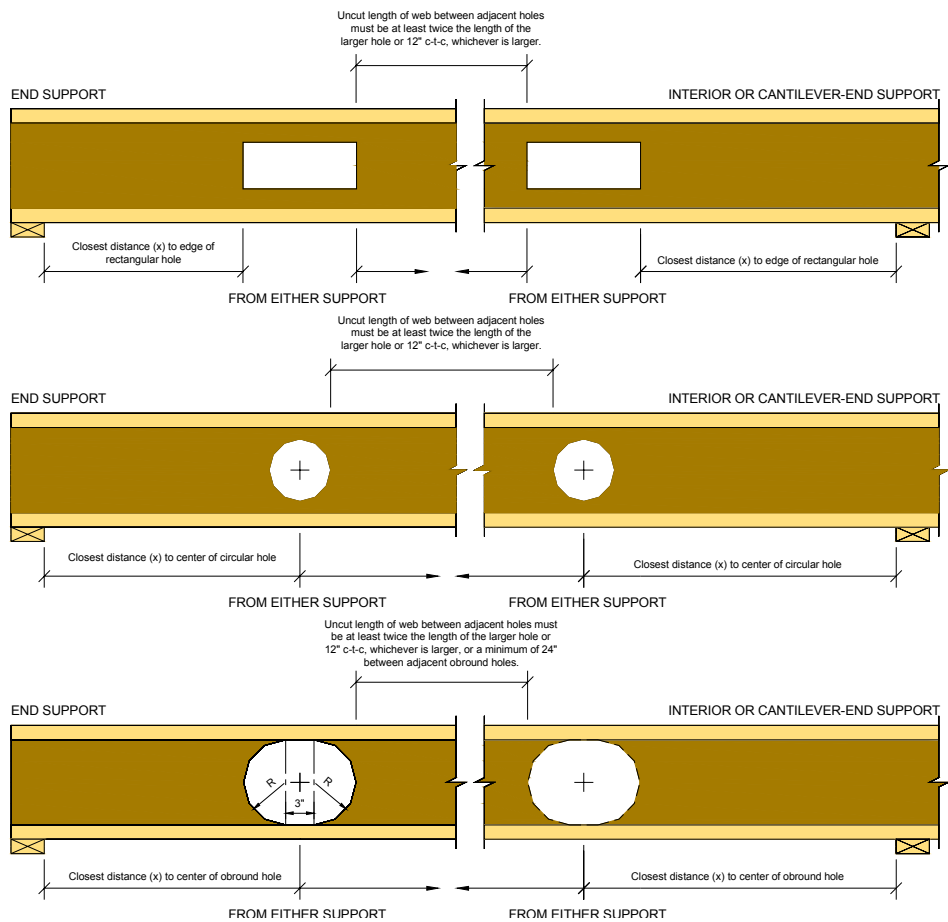


FIGURE 2. I-JOIST LOAD BEARING CANTILEVER DETAILS

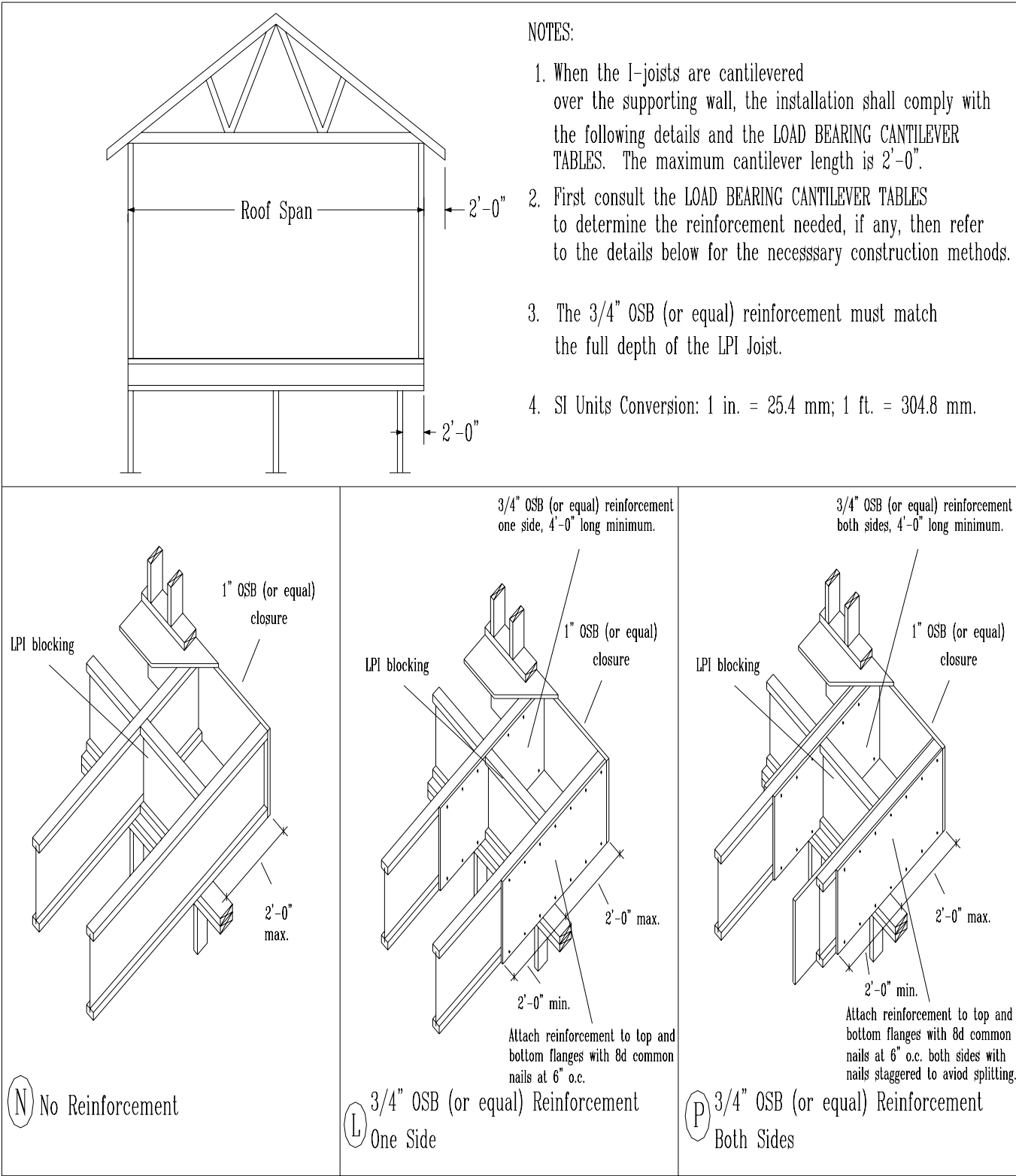
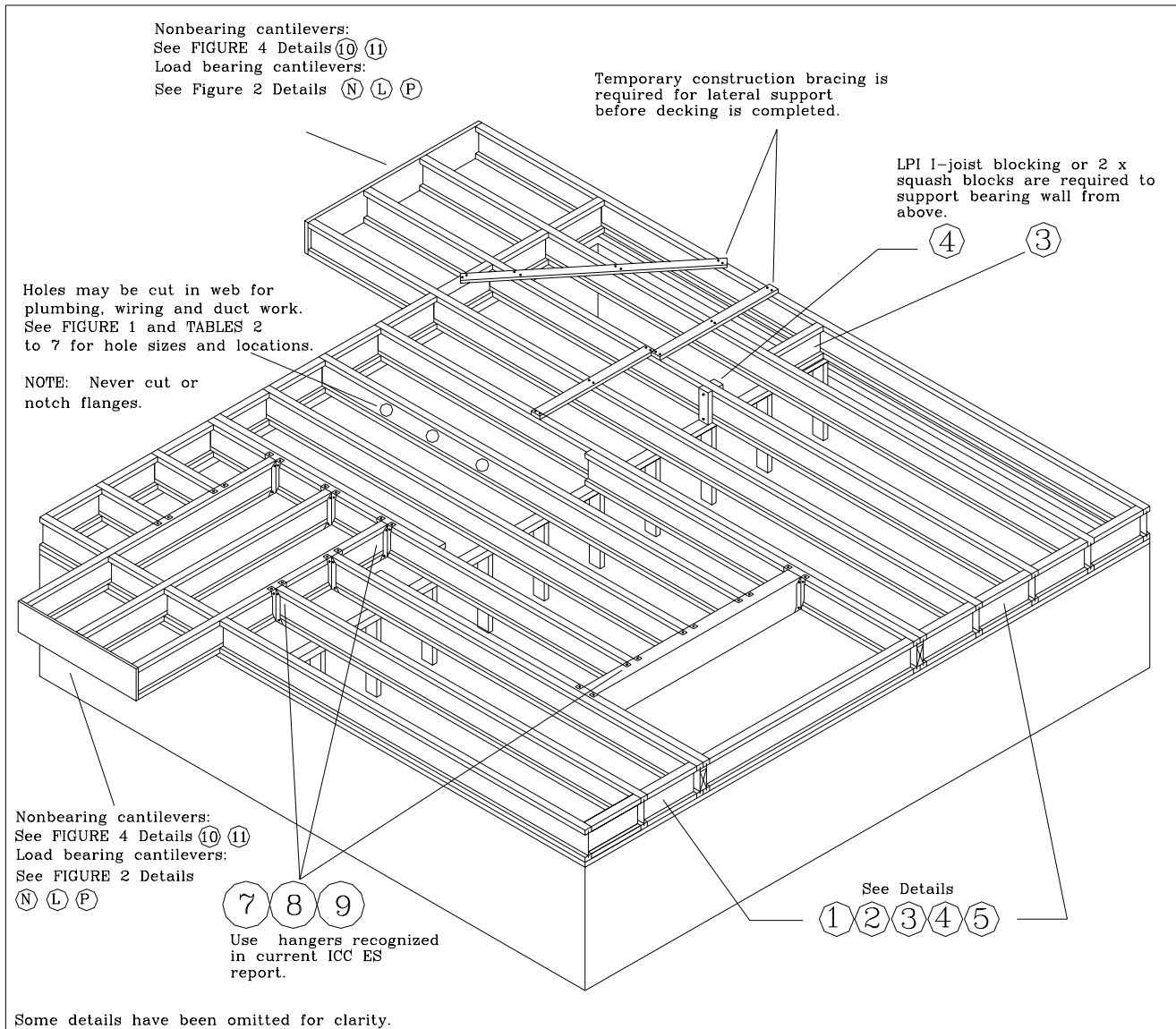


FIGURE 3. TYPICAL I-JOIST FLOOR LAYOUT

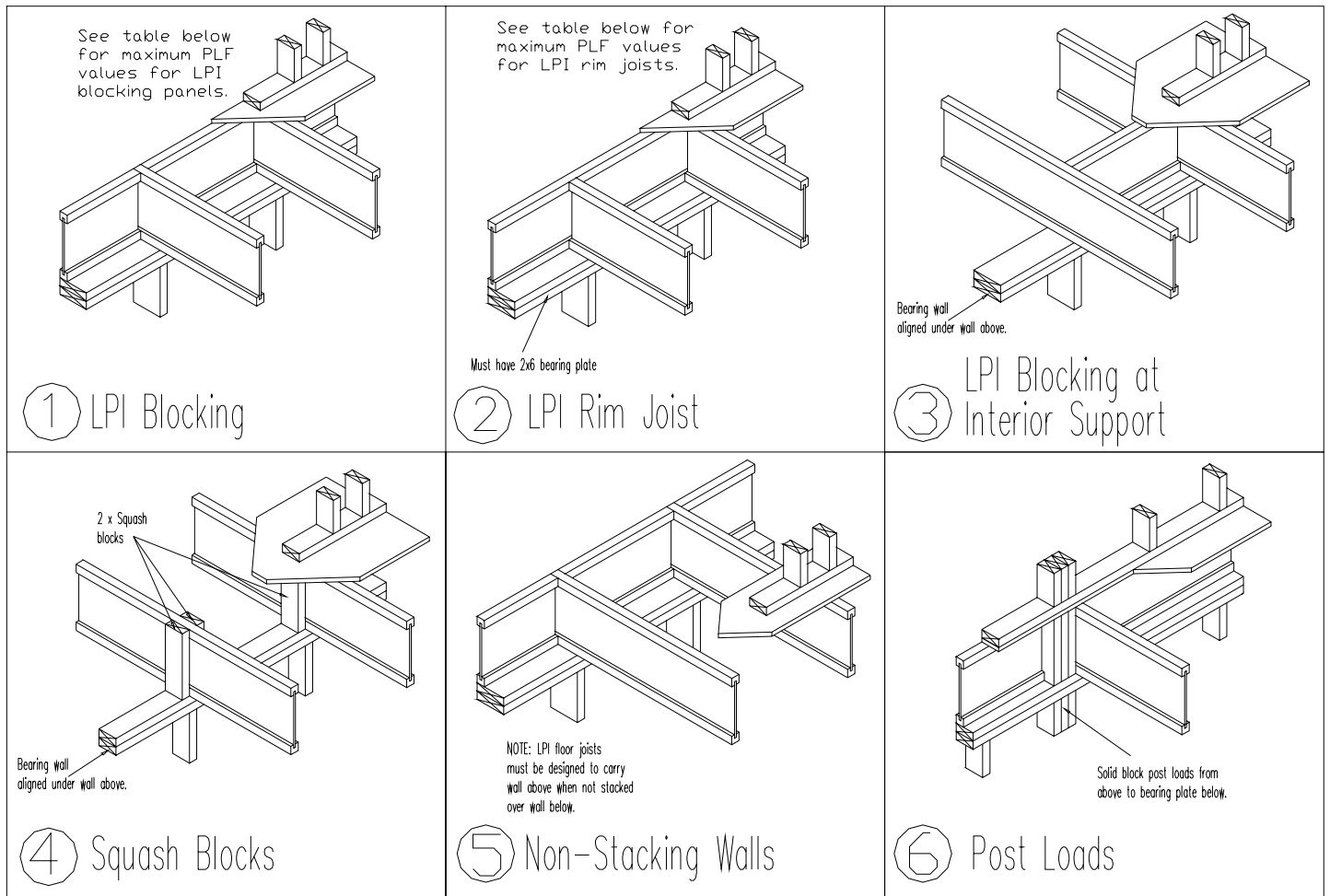


For SI Units Conversion: 1 ft. = 304.8 mm.

NOTES:

1. These instructions are offered as a guide and are typical for good practice in the handling, storage and installation of I-joists. In some instances, other or additional details may be necessary.
2. All rim joists, blocking, connections, and temporary bracing must be installed before erectors are allowed on the structure.
3. No loads other than the weight of the erectors are to be imposed on the structure before it is permanently sheathed.
4. Numbered details are noted in Figure 4.

FIGURE 4. I-JOIST FLOOR FRAMING DETAILS



NOTES:

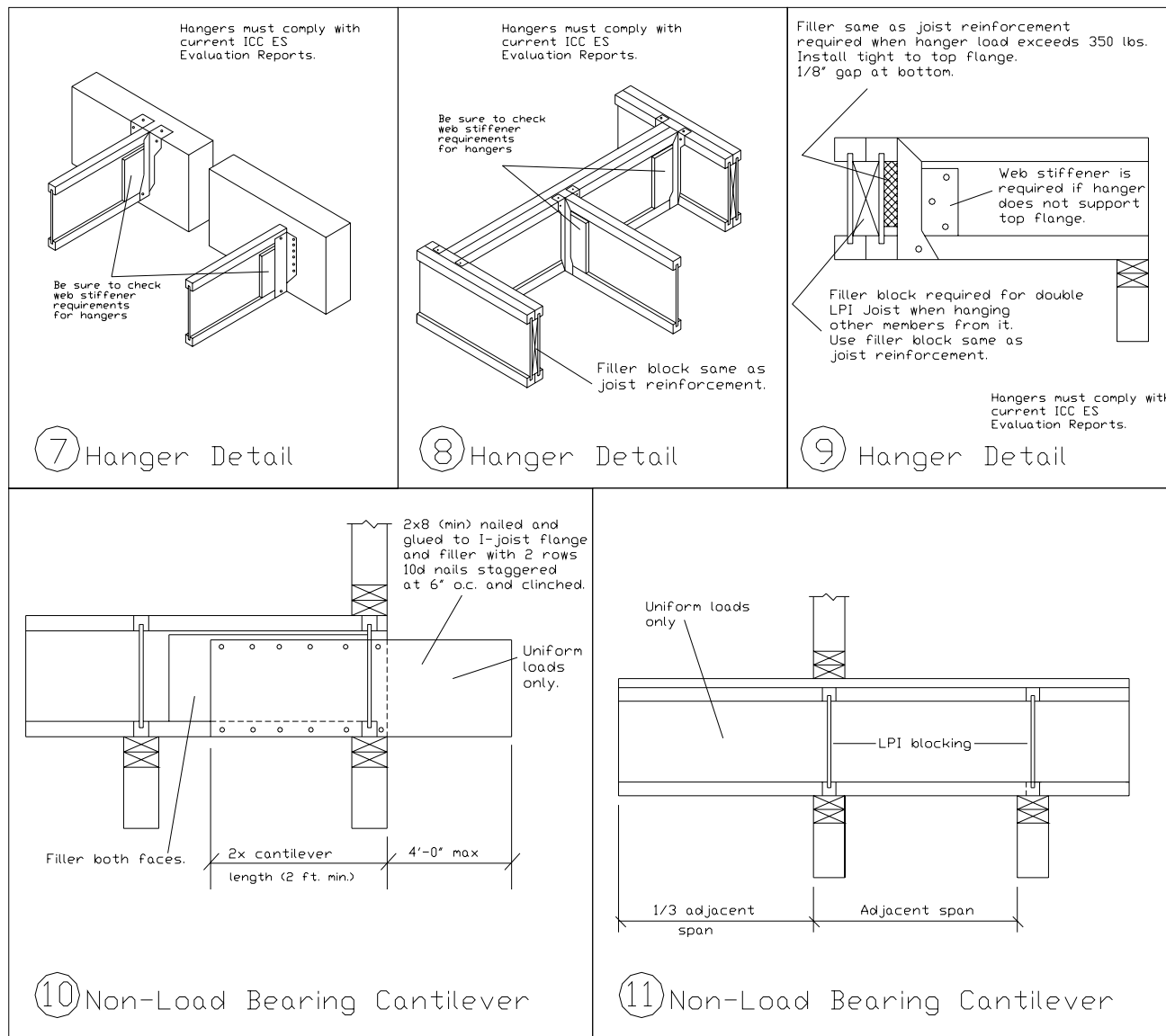
1. 1-1/2" minimum bearing is required at joist ends. 3-1/2" minimum bearing is required at intermediate supports.
2. Top and bottom flanges must be laterally retained at all supports.
3. Lateral support should be considered for bottom flange where there is no sheathing on underside.
4. Refer to Table 8 for I-joist nailing schedules.

LPI RIM JOIST OR BLOCKING PANEL MAXIMUM PLF DESIGN VALUES		
JOIST SERIES	JOIST DEPTH	MAXIMUM (PLF)
LPI 32W LPI 32 LPI 42X1.8	9-1/2"	2200
	11-7/8"	2200
	14"	1600
	16"	1500
LPI 20W LPI 20 LPI 20X1.5 LPI 20X1.7	9-1/2"	1907
	11-7/8"	1762
	14"	1600
	16"	1500

For **SI** Units Conversion: 1 in. = 25.4 mm; 1 PLF = 14.6 N/m

NOTE: The allowable shear values in pounds per foot (up to 230 PLF) for horizontal wood structural panel diaphragms with framing of nominal 2-inch thick Douglas fir-larch or southern pine are applicable to LPI Rim Joist.

FIGURE 4. I-JOIST FLOOR FRAMING DETAILS (Continued)



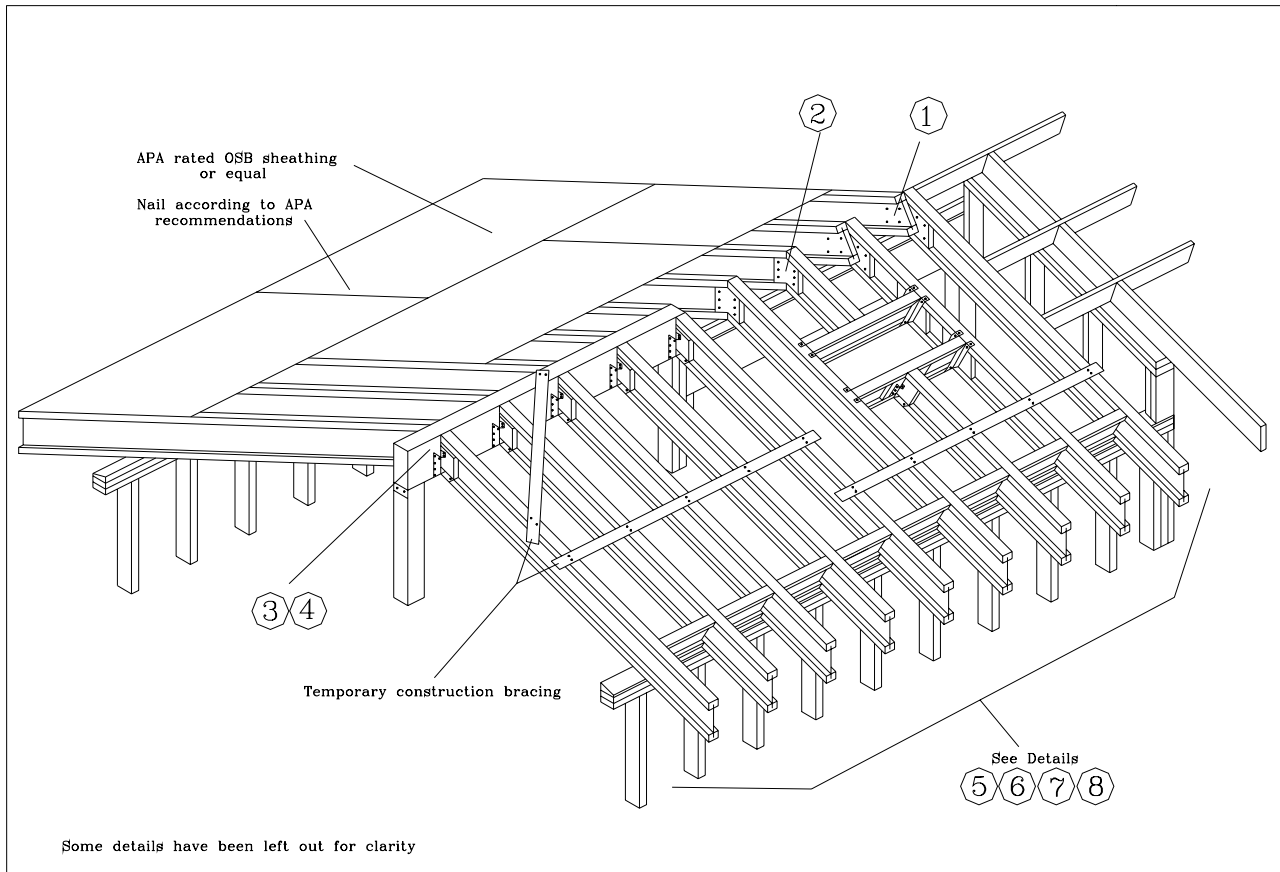
FILLER BLOCKS:

For all I-joist series except for the LPI 42X1.8 series, use 2x lumber (minimum SPF) + 5/8-inch OSB (or equal) attached with two rows of 8d nails staggered at 6 inches on center from each side. For the LPI 42X1.8 series I-joists, use two 2x lumber (minimum SPF) attached with two rows of 10d nails staggered at 6 inches on center from each side.

FILLERS:

For all I-joist series except for the LPI 42X1.8 series, use 2 pieces of 1/2-inch OSB (or equal) attached with two rows of 8d nails staggered at 6 inches on center from each side. For the LPI 42X1.8 series, use 2x lumber (minimum SPF) attached with two rows of 10d nails staggered at 6 inches on center from each side.

FIGURE 5. TYPICAL I-JOIST ROOF LAYOUT

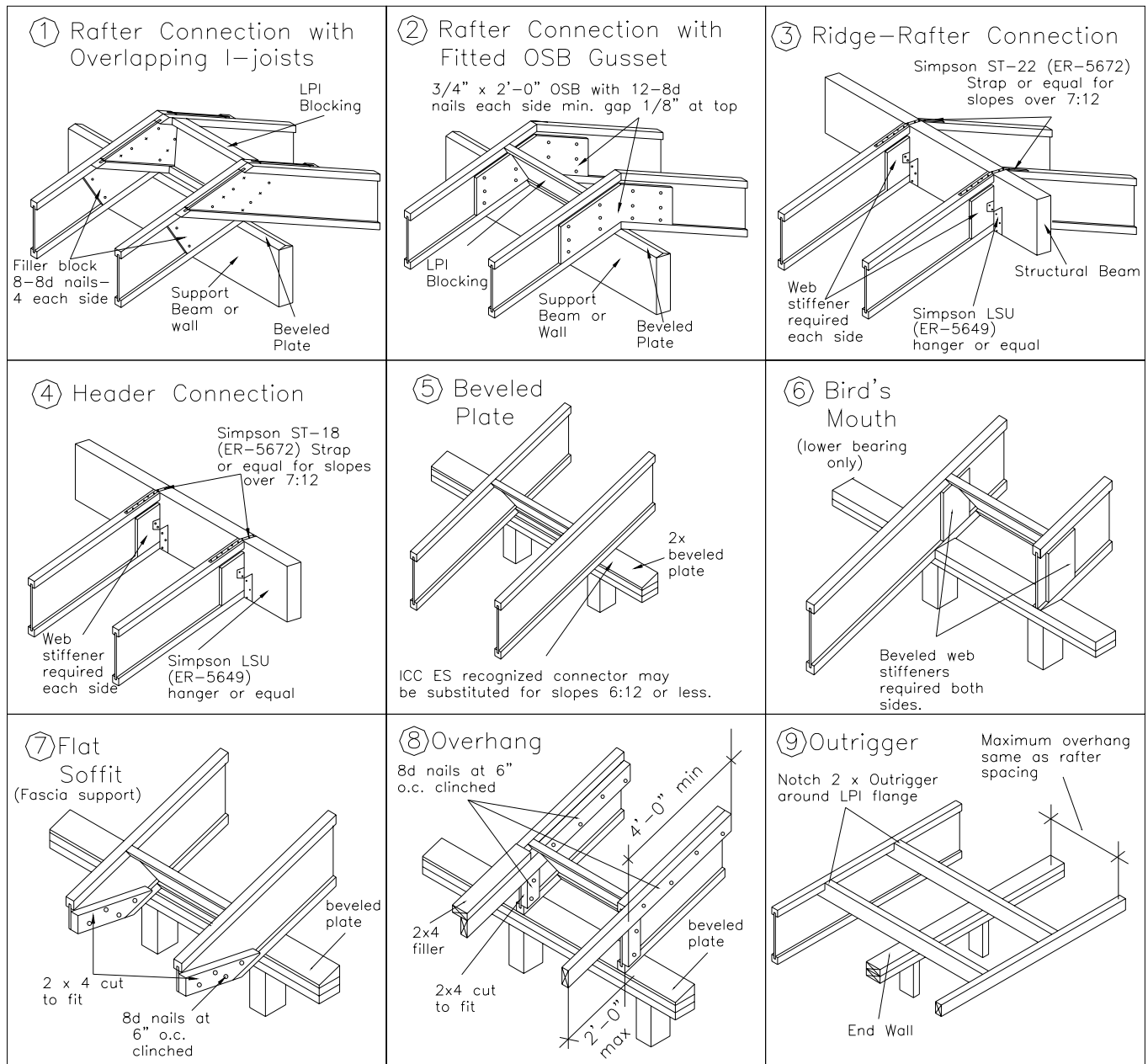


For SI Units Conversion: 1 ft. = 304.8 mm.

NOTES:

1. These instructions are offered as a guide and are typical for good practice in the handling, storage and installation of I-joists.
2. All rim joists, blocking, connections, and temporary bracing must be installed before erectors are allowed on the structure.
3. No loads other than the weight of the erectors are to be imposed on the structure before it is permanently sheathed.
4. Numbered details are noted in Figure 6.

FIGURE 6. I-JOIST ROOF FRAMING DETAILS

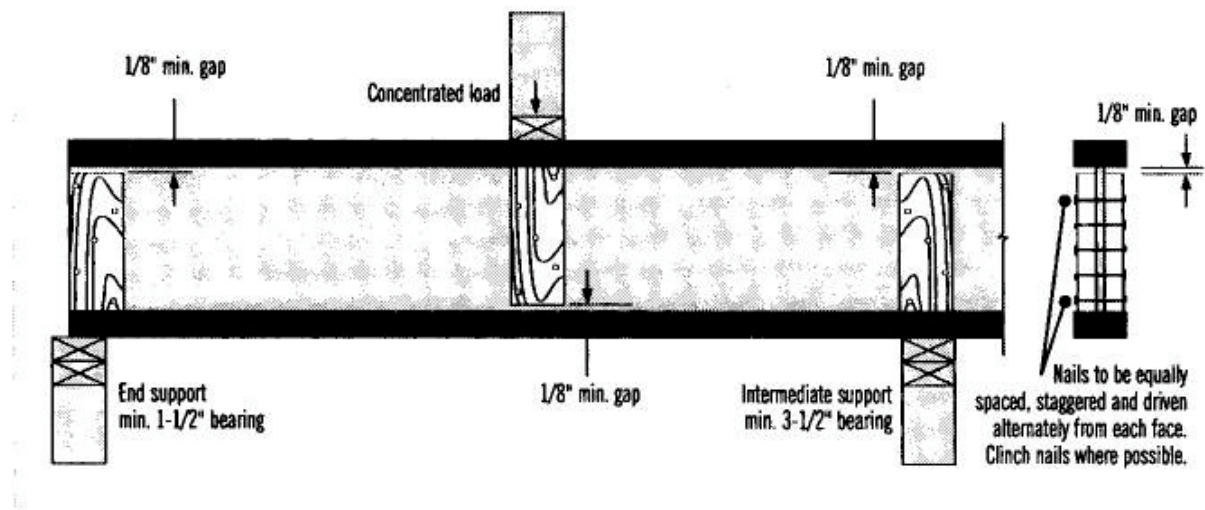


For SI Units Conversion: 1 in. = 25.4 mm; 1 ft. = 304.8 mm.

NOTES:

1. I-joist flange may be birdsmouth cut only at low end of the I-joist. Birds mouth cut must not overhang the inside face of bearing plate. The I-joist must bear fully on plate.
2. All end bearings must be laterally supported. The I-joist blocking is recommended.
3. All details are valid to a maximum 12:12 slope unless otherwise noted.
4. Refer to TABLE 8 for I-joist nailing schedules.

FIGURE 7. I-JOIST WEB STIFFENER DETAILS



For SI Units Conversion: 1 in. = 25.4 mm; 1 ft. = 304.8 mm; 1 lbf = 4.5 N.

NOTES:

- 1. Web Stiffeners, when required, must be installed in pairs – one to each side of the web. In addition to the requirements noted in Table 1, web stiffeners are required at birds-mouth cut locations, at sloped hanger locations, and for lateral support of the joist when used with hangers if the sides of the hanger do not laterally support the I-joist flange.
- 2. Web stiffeners should be cut to fit between the flanges of the I-joist, leaving a minimum 1/8 inch gap (1 inch maximum). At bearing locations, the stiffeners should be installed tight to the bottom flange with the gap to the top flange. At locations of concentrated loads, the stiffeners should be installed tight to the top flange with the gap to the bottom flange.
- 3. Web stiffeners should be cut from APA-rated (or equal) OSB or plywood, or from 2x lumber or structural composite lumber.
- 4. Web stiffeners should be the same width as the bearing surface, with a minimum of 3-1/2 inches.
- 5. For all I-joist series except for the LPI 42X1.8 series, web stiffeners shall be a minimum of 23/32 inch thick. For the LPI 42X1.8 series I-joists, web stiffeners shall be a minimum of 1-1/2 inches thick.
- 6. For all I-joist series except for the LPI 42X1.8 series, nail web stiffeners to the I-joist with 5-8d nails, equally spaced and staggered (see drawing above). For the LPI 42X1.8 series I-joists, nail web stiffeners to the I-joist with 5-10d nails, equally spaced and staggered.

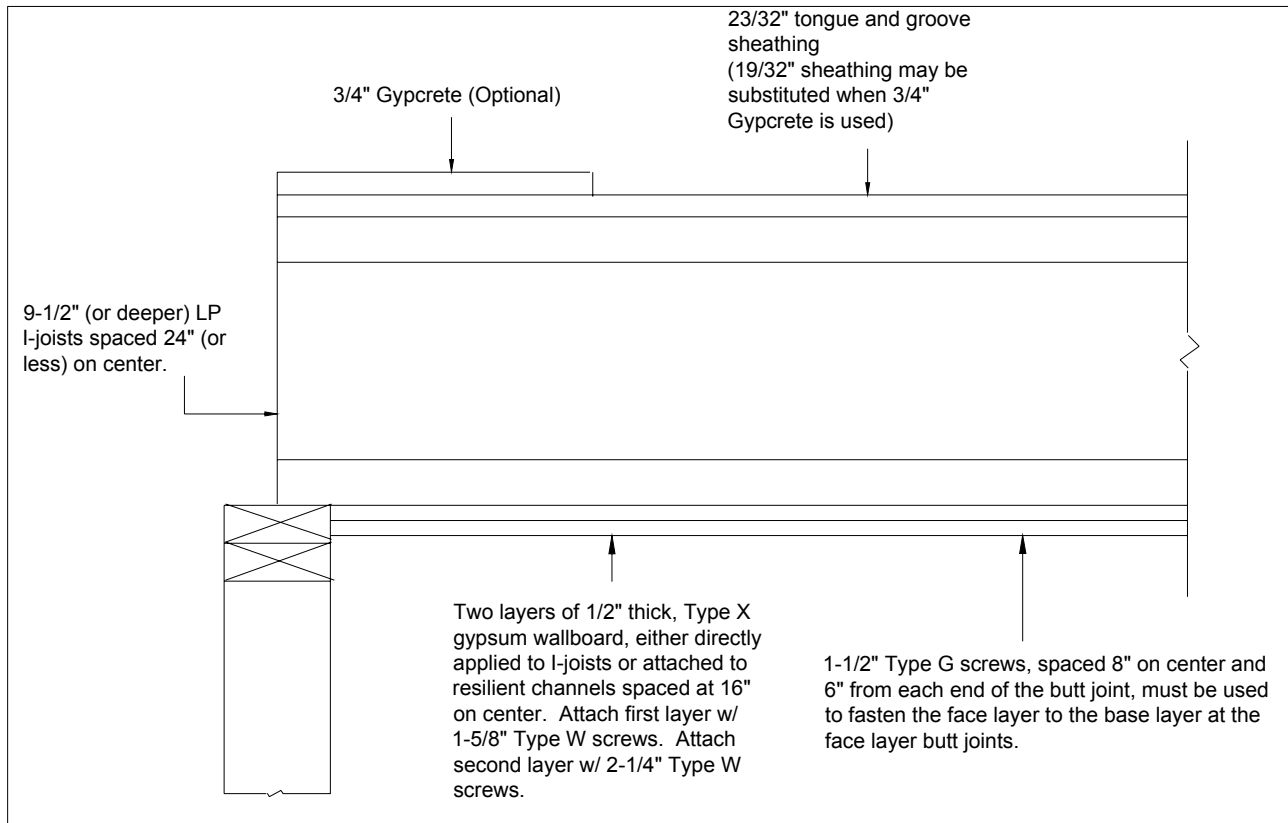
	JOIST DEPTH			
	9-1/2"	11-7/8"	14"	16"
STIFFENER HEIGHT	6-3/8"	8-3/4"	10-7/8"	12-7/8"

TABLE 8. NAILING SCHEDULES

I-JOISTS TO SUPPORTS		
NAIL SIZE	MINIMUM DISTANCE FROM JOIST END	CLOSEST O.C. SPACING
8d box, common	1"	2"
10d box	1"	2"
12d box	1"	2"
16d sinker	1-1/2"	3"
SHEATHING TO I-Joist TOP FLANGE		
8d box, common	1"	2"
10d box	1"	2"
12d box	1"	2"

For SI Units Conversion: 1 inch = 25.4 mm.

FIGURE 8. ONE-HOUR FLOOR-CEILING FIRE-RESISTIVE ASSEMBLY



For SI Units Conversion: 1 in. = 25.4 mm.

TABLE 9. SOUND AND IMPACT RATINGS FOR ONE-HOUR FLOOR-CEILING ASSEMBLY

FLOOR ASSEMBLY	STC	IIC
w/o GYPCRETE	50	50
w/ RESILIENT CHANNEL with CARPET/PAD		
w/ GYPCRETE	50	50
w/ RESILIENT CHANNEL with CARPET/PAD		
w/ GYPCRETE	50	50
w/o RESILIENT CHANNEL with CARPET/PAD		

NOTES:

1. Carpet is the minimum 57-ounce carpet with 0.531 inches pile height, 1/2 inch thick, and 4 pcf density foam pad.
2. Vinyl is the minimum 0.06 inches thick with cushioned vinyl of minimum 0.01 inches thick wear layer.
3. Gyp-Crete is the minimum 3/4 inches thick over 19/32 inches plywood. The plywood must be glued at tongue and groove joints and to the I-joists.
4. Cavity is insulated with 3-1/2 inch thick fiberglass batts between joists.
5. For other details see FIGURE 8.